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AMERICAN FIRE ENGINE COMPANY

SENECA FALLS, NEW YORK
AND CINCINNATI, OHIO

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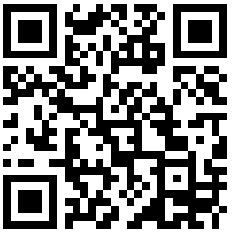

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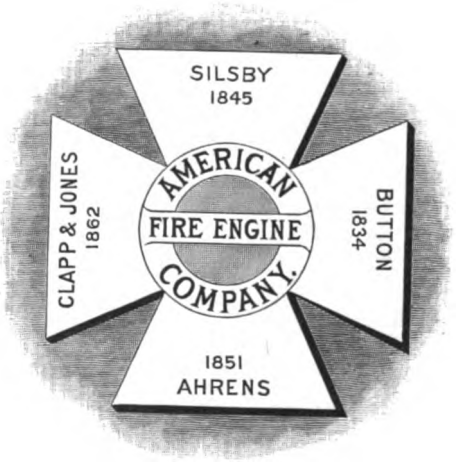

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ILLUSTRATED CATALOGUE

OF

PISTON AND ROTARY STEAM FIRE ENGINES,

HOSE CARRIAGES, CARTS, AND WAGONS,

PUMPS FOR FIRE BOATS, FIRE PROTECTION, ETC.

HEATERS FOR FIRE ENGINES AND ENGINE HOUSES,

STEAM HEATERS FOR WARMING BUILDINGS,

AND

FIRE DEPARTMENT SUPPLIES.

AMERICAN FIRE ENGINE COMPANY,

SENECA FALLS, NEW YORK,

AND

CINCINNATI, OHIO.

1893

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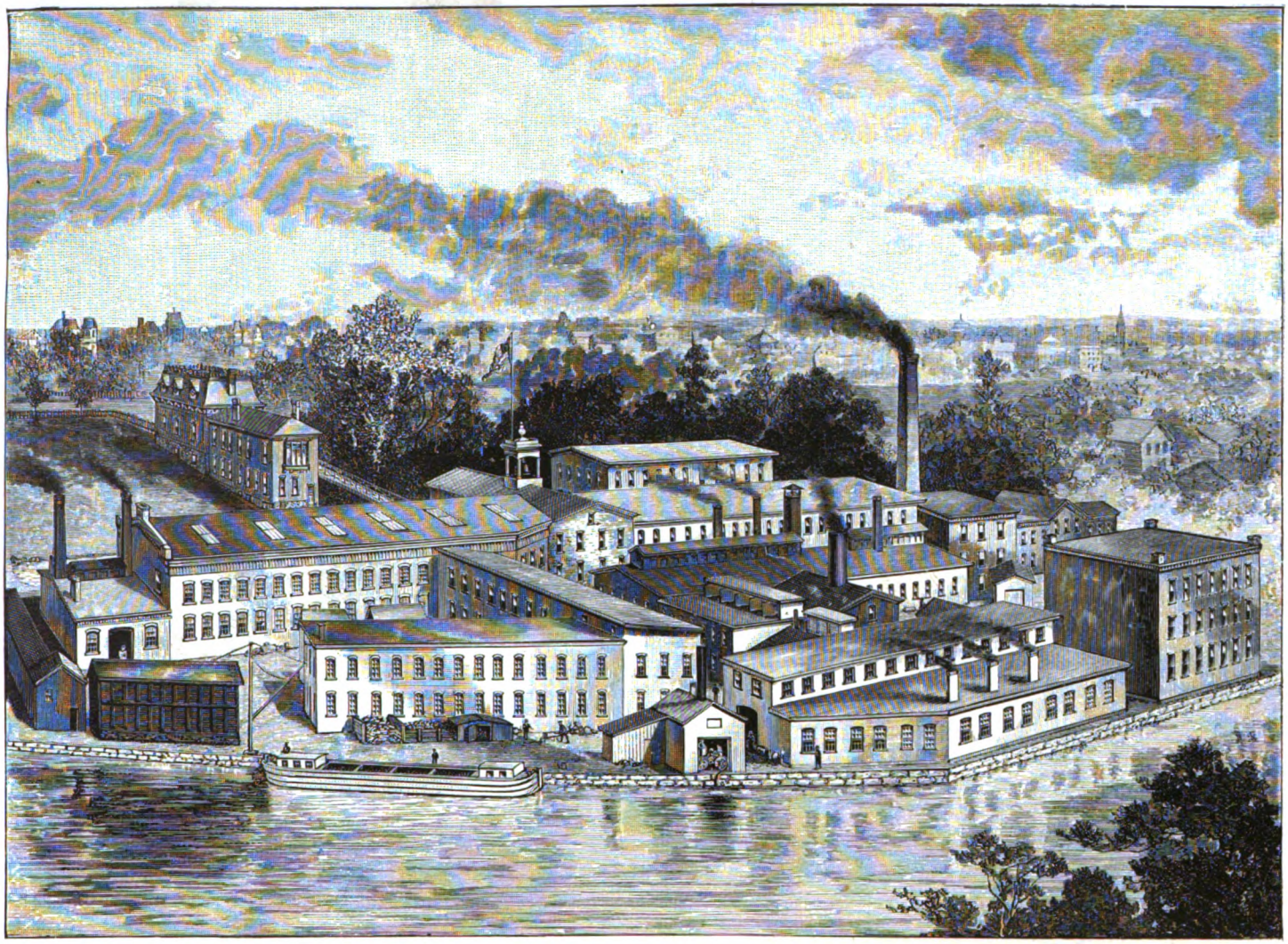

WORKS AND PRINCIPAL OFFICE AT SENECA FALLS. FOUNDED IN 1845.

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❋ ❋ ❋ OUR ENGINES ❋ ❋ ❋

Are used in all the principal Fire Departments of the United States, among which we may mention the following, with the number of engines in service :—

Chicago, 67.

St. Louis, 41.

New York, 37.

Cincinnati, 32.

Philadelphia, 33.

Boston, 25.

Cleveland, 18.

Louisville, 17.

New Orleans, 17.

Milwaukee, 16.

Minneapolis, 11.

Detroit, 10.

St. Paul, 10.

Buffalo, 10.

Columbus, 10.

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WORKS AND BRANCH OFFICE AT CINCINNATI. FOUNDED IN 1851.

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THE PATENTS

Owned and exclusively controlled by us, a list of which is given below, cover some of the most important features of steam fire engines, as well as of other apparatus, and purchasers may rely upon there being embodied in all goods manufactured by us the very latest and most valuable improvements.

Number.	Date of Issue.	Number.	Date of Issue.
182,723	September 26, 1876.	287,211	October 23, 1883.
182,724	September 26, 1876.	290,450	December 18, 1883.
189,414	April 10, 1877.	292,396	January 22, 1884.
204,885	June 18, 1878.	324,207	August 11, 1885.
207,309	August 20, 1878.	326,186	September 15, 1885.
213,309	March 18, 1879.	358,430	March 1, 1887.
237,764	February 15, 1881.	365,448	June 28, 1887.
237,988	February 22, 1881.	365,618	June 28, 1887.
238,603	March 8, 1881.	376,330	January 10, 1888.
242,672	June 7, 1881.	385,692	July 10, 1888.
243,938	July 5, 1881.	485,112	October 25, 1892.
276,060	April 17, 1883.	495,868	April 18, 1893.

Other patents pending.

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TO THE PUBLIC.

In issuing this our second catalogue, we desire to thank you for your liberal patronage during the past year, which, we are gratified to state, has enabled us to carry out to a great extent the objects of this company. This patronage, we are led to believe, is not only an indorsement of that object and an expression of general approval, but also an acknowledgment that our efforts to carry out the same, if not wholly, at least in a great measure, have succeeded.

In reviewing our year's business we are more than assured on this point, as we find that we have not only built engines for most of the principal fire departments of the United States (cities which have successfully used these machines for many years), but for a large number of places which we look upon as new customers, and whose future patronage we hope to merit and receive.

At its inception, the object of the American Fire Engine Company was to produce steam fire engines and rolling stock for the fire service, of their own designing, and also to manufacture the well known Ahrens, Silsby, Clapp & Jones, and Button engines in an improved and approved manner. In an improved manner, as the mechanical skill and experience of the former builders are now employed by this company; and in an approved manner, as the consolidation of details of manufacture and business interests enables us to give customers the very best value for the goods for which they favor us with their orders.

Many improvements have been effected by this company in the details of the construction of these various machines by the utilization in whole of the many patents heretofore controlled by the four original owners, enabling it at will, and at the wish of customers oftentimes, to embrace in one machine certain parts formerly distinctive features of each particular engine. Among the various pieces of apparatus produced by this company may be mentioned the "Columbian" engine, a full description of which is given elsewhere in this catalogue. This machine,

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whether for use in the outskirts of a large city or in smaller places, is admirably adapted for its purpose, combining as it does in itself the efficiency and effectiveness of two or more pieces of apparatus heretofore used to accomplish the same work. We call special attention to this machine, as it is an entirely new addition to the fire service rolling stock; and we are convinced that it will meet the requirements, not only of many places now entirely without fire protection, but of many also that desire to increase their means of fire protection at a small outlay.

Trusting that during the coming year we may receive a continuance of the liberal patronage that has heretofore been accorded us, we remain

Very respectfully yours,

AMERICAN FIRE ENGINE COMPANY.

INCORPORATED
UNDER THE LAWS OF NEW YORK STATE,
DECEMBER 12, 1891.

CAPITAL $600,000.

CHRIS AHRENS, President.
GEORGE E. HOLROYD, Vice-President.
CHARLES T. SILSBY, Treasurer.
WILLIAM S. SILSBY, Secretary.

HORACE SILSBY, Manager Seneca Falls Works.
G. F. HAWEKOTTE, Manager Cincinnati Works.
G. F. AHRENS, Mechanical Engineer.
HERMAN H. WEFEL, JR.

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STEAM FIRE ENGINES.

On the following pages are given illustrations and descriptions of the various styles of machines manufactured by us, in which the peculiar features of each pattern of engine are fully set forth. Below we give such particulars as are applicable to all the different engines as now made at our several manufactories.

CONSTRUCTION AND FINISH.

Each machine is made throughout of the best materials, and is constructed and finished in the most workmanlike manner. Every engine is fully warranted by us, and we agree to repair or replace at our expense such parts, should there be any, as may fail by reason of defective material or workmanship.

The boiler is suitably jacketed, and is surmounted with a nickel-plated dome, while the fixtures are highly polished and heavily nickel plated. The frame, running gear, and fuel pan are handsomely painted, with gold striping and ornamentation.

The engines are adapted to be drawn by horses only, or by horses or men, as may be desired by purchasers. If to be drawn by horses the machine is supplied with pole and whiffletrees, driver's seat, leather cushion, whip socket, foot board, gong, and a brake to be operated by the driver's foot. If to be drawn by horses or men a "combination pole" is furnished, fitted for either horse or hand use, with seat, cushion, whip socket, foot board, rope reel with 120 feet manila drag rope, and a brake that is operated from the fuel pan in the rear.

Any change in details of construction and finish can be made at the wish of customers.

CAPACITIES.

The capacities of our engines vary according to size and type, and are as follows :—

Special, ...			1300	gallons per minute.
Extra First Size,	1100	to	1200	gallons per minute.
First Size, . . .	950	to	1000	gallons per minute.
Second Size, . .	700	to	800	gallons per minute.
Third Size, . .	600	to	700	gallons per minute.
Fourth Size, . .	450	to	600	gallons per minute.
Fifth Size, . .	375	to	500	gallons per minute.
Sixth Size, . .	300	to	400	gallons per minute.

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WEIGHTS.

There is necessarily considerable variation in the weights of engines, even of the same size and same make, depending upon the conditions under which they are used. An engine built for service in a large city, where the pavements are rough and the usage is frequent and severe, requires extra heavy running gear; while the same machine, if intended for a smaller town, can be safely made several hundred pounds lighter in weight. Owing to the advantages possessed by our several types of engines, we are enabled to supply machines of any stated capacity and for any particular service considerably lighter in weight than any other manufacturer.

The weights may be approximately given as follows :—

Special, extra heavy running gear, as built for the Chicago Fire Department, . . .	8700 pounds.
Extra First Size,	7500 to 8500 pounds.
First Size, . .	6800 to 7600 pounds.
Second Size, . .	6300 to 7000 pounds.
Third Size, . .	5300 to 6200 pounds.
Fourth Size, . .	4500 to 5500 pounds.
Fifth Size, . .	3700 to 4300 pounds.
Sixth Size, . .	2600 to 4000 pounds.

APPURTENANCES.

In addition to the articles enumerated below, each engine is supplied with such special fixtures or appliances as may be necessary for its proper working. All our engines have the following :—

A smooth-bore rubber Suction Hose, carried in brackets on the machine, with couplings and strainer. The suction hose will be arranged to suit purchasers, either connected directly to the pump, or in two separate pieces, one on either side of the engine.

Copper Air Chamber; Fuel Pan, with room for fuel and for fireman or stoker to ride; Variable Exhaust, enabling the engineer to regulate the fire at will; Brass Feed Pump, also feed pipe from main pump; Steam and Water Pressure Gauges; Glass Water Gauge; Try Cock Gauge, with cocks; Pop Safety Valve; Brass Signal Whistle; Steam Blast Nozzle, for improving the draft; Surface Blower and Pipe; Blow-off Cock and cleaning holes in leg of boiler; Cleaning Hose and connections; Pair of Fenders for Wheels; Grate Bars; Name Plate, engraved with name and number; a suitable number of Fire Department Hand Lanterns, carried in brackets; Two Play Pipes, with sufficient connections and nozzles to work the machine to its full capacity; Tool Box, with all necessary tools and wrenches required about the machine.

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AHRENS STEAM FIRE ENGINE.

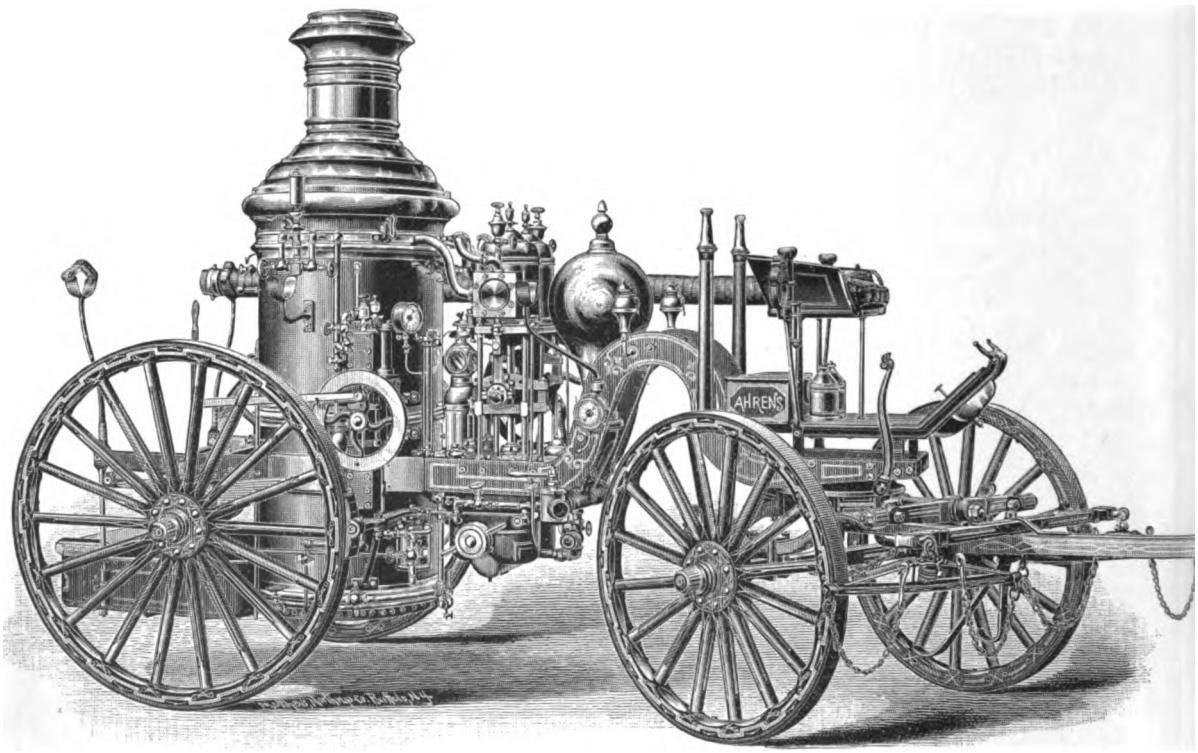

FIG. 5.

This machine is of the piston type, and its peculiar features can be readily understood from the cuts and description which follow.

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THE AHRENS ENGINE.

The most special feature of this machine, and the one that has made it so popular and distinctive, is its improved Coil Boiler, which possesses great durability with minimum cost for repairs. It will raise sufficient steam for effective duty from cold water, starting with full gauges of water in the boiler, quicker than *can possibly be done* with any other fire engine boiler, even when the dangerous practice of drawing the water below the crown sheet and partially out of the flues is resorted to for the purpose of quick steaming.

This boiler is guaranteed to make sufficient steam for the engine to go to work and throw water from the nozzle in four minutes from the time of lighting the fire in the boiler with full gauges of water in the same; and thus starting with full gauges of water, the steam once raised is effective and increases in volume until the required maximum is reached, instead of decreasing or "falling back," as it is termed, which is the case with boilers where the water is "drawn off" to expedite the quick and delusive appearance of effective pressure on the steam gauge.

Water is drawn from the leg of the boiler by means of a circulating pump, and forced into the coils at their lower ends, generating steam while passing upward through the coils, the remaining water with the steam returning into the shell at the top of the boiler; so there is no heat wasted by putting too much water in the coils.

There are upright slats which support the coils. By removing the bolts from these slats and breaking joints top and bottom, any or all sections of coils can be removed should any repairs be necessary, and any or all can be replaced in a few hours. The water on entering the coils is separated into two parts, and afterwards into four parts, by a patent device inserted in the dividers at the bottom, so that each section receives its equal amount of water in proportion to the number of feet of pipe in the section.

From thirty-one to forty-five gallons of water can be carried in this boiler without interfering with the generation of steam, as steam can be generated as readily with the large as with the smaller quantity.

There being neither flue nor crown sheet, a wide variation in the quantity of the water carried in the boiler is permissible without detriment to the same, as all the parts in contact with the fire are always fully protected.

Proper provision is made for the contraction and expansion of the coils, thus there is no strain on the steam joints.

The coils being supplied with water by the circulating pump, a forced and strong circulation in the boiler is created. This is a very reliable and quick way of generating steam, and also a positive way of avoiding any collection of sediment or scale. Experience shows that after fifteen or twenty years' use of a boiler of this

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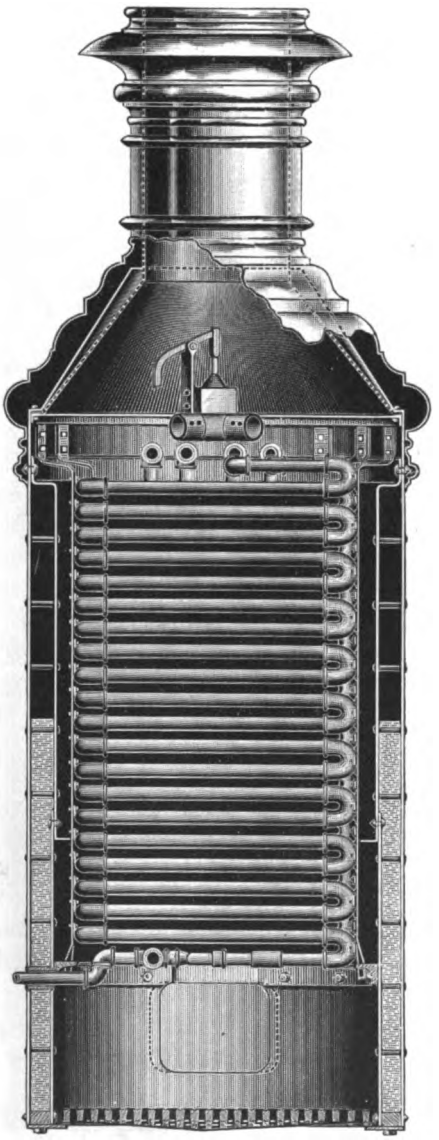
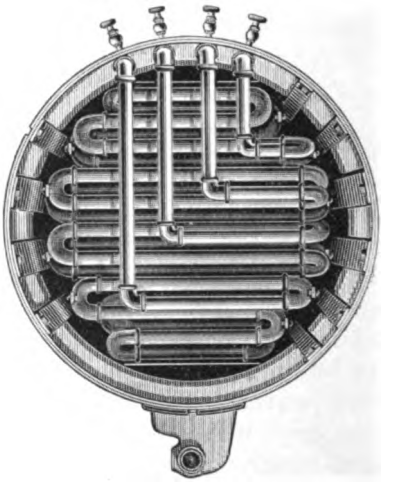
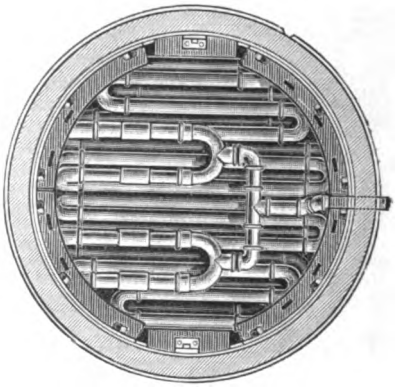
kind, there is no scale to be found in the inside of the coils, and as there is no accumulation of scale or soot on the outside of the coils, they do not ever require cleaning.



SECTIONAL VIEW.



TOP VIEW.



BOTTOM VIEW.

It will thus be seen from the above description, that this is entirely different from any other fire engine boiler, consisting as it does of a steam and water space which forms the fire box inside of the inner sheet, to which are securely

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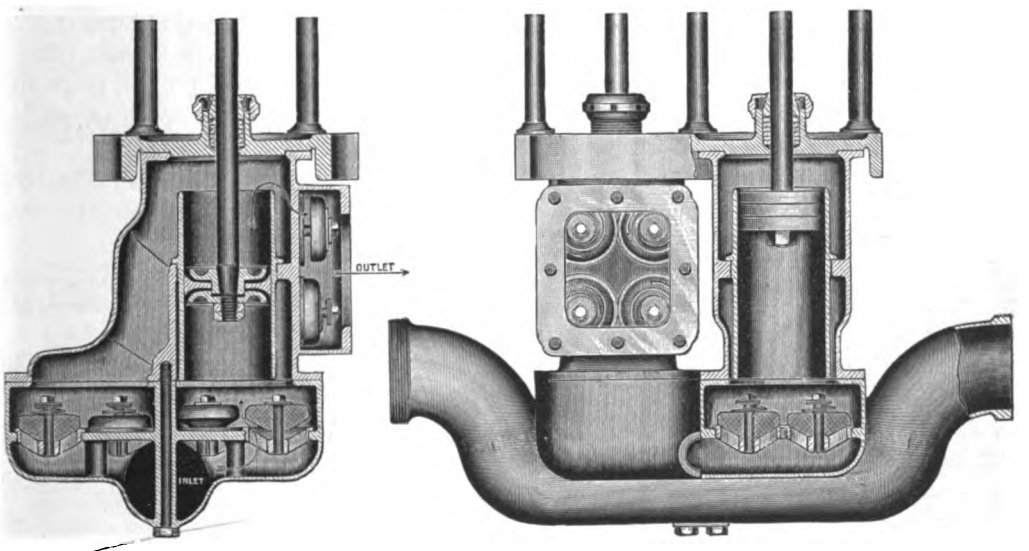
fastened three or more coils, according to the size of the engine. Through these the water is forced, thus giving an abundance of heating surface, all fully protected by water, and thus preventing the possibility of the burning of any parts exposed to the fire.

The boiler is furnished with our improved variable exhaust. By it the draft can be increased or decreased, at the pleasure of the engineer, as the circumstances may require.



The pumps are shown in the illustrations, one representing a vertical section and one a front elevation and half section. They are of novel construction, and, as well as the valve seats and barrels, are made of gun metal bronze; no cast iron or other metal subject to corrosion by water is used in any of the parts. All the receiving valves are upright and self-seating on the lower face or body of the pump. Every valve spring might be destroyed without the pump being disabled, as it would be perfectly capable of doing fire duty. We are owners of the Wilcox patent on valves. In addition to the advantages mentioned above, by the use of these valves the water enters the pump without any change in its course, there being no angles or obstructions to impede its direct flow.

WILCOX VALVE.

Repairs can be very easily and quickly made, as the pump barrels and valve seats are made separate from the body, and the pump is so constructed that an examination of the valves can be made by simply removing the suction cap. For repairs, the valve chamber with valves can be removed and replaced in a very short time.

By the use of the Wilcox valves and seats, the machine is capable of working at a high speed, and thus its pumping capacity is great and water is delivered in large quantities.

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The steam cylinders and pumps of this machine are detached from the boiler, and are separated therefrom sufficiently to allow every facility for getting at each and every part.

All connections, both steam and water, are made outside of the boiler.

The cylinders are of the ordinary slide valve type, of the kind familiar to most mechanics, and they can thus be very easily repaired when necessary.

This company owning exclusively for use on steam fire engines, the Corliss Patent Ring Packing, these engines are built with that justly popular packing.

This machine is built on the Scotch yoke style. The yokes are forged from the solid, and the faces of the same are lined with oil-tempered steel plates, preventing them from wearing unevenly. These plates can be easily removed and replaced should it become necessary at any time.

The pump rods are of steel, covered with seamless brass tubing. The yokes and slides are provided with plates of various thicknesses, to take up any wear. They will last for years without renewing.

The larger sizes of these machines are built with double pumps and cylinders, "crane-neck" style; and are hung on our patent equalizing platform springs forward, and half-elliptic springs in the rear. The two smaller sizes are built with straight frames, and have a single cylinder and pump. The springs are half-elliptic both front and rear, and the machines are adapted to be drawn by either horses or men, having a "combination pole" with rope and reel, and a seat for driver. Our illustrations show both styles of engines.

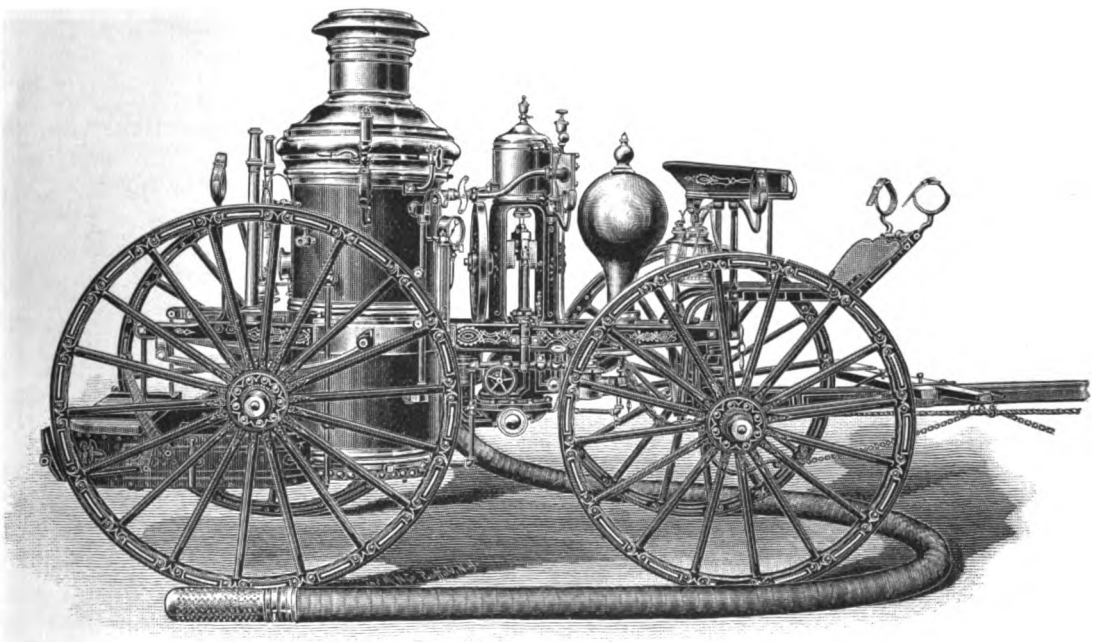

FIG. 6.

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SILSBY STEAM FIRE ENGINE.

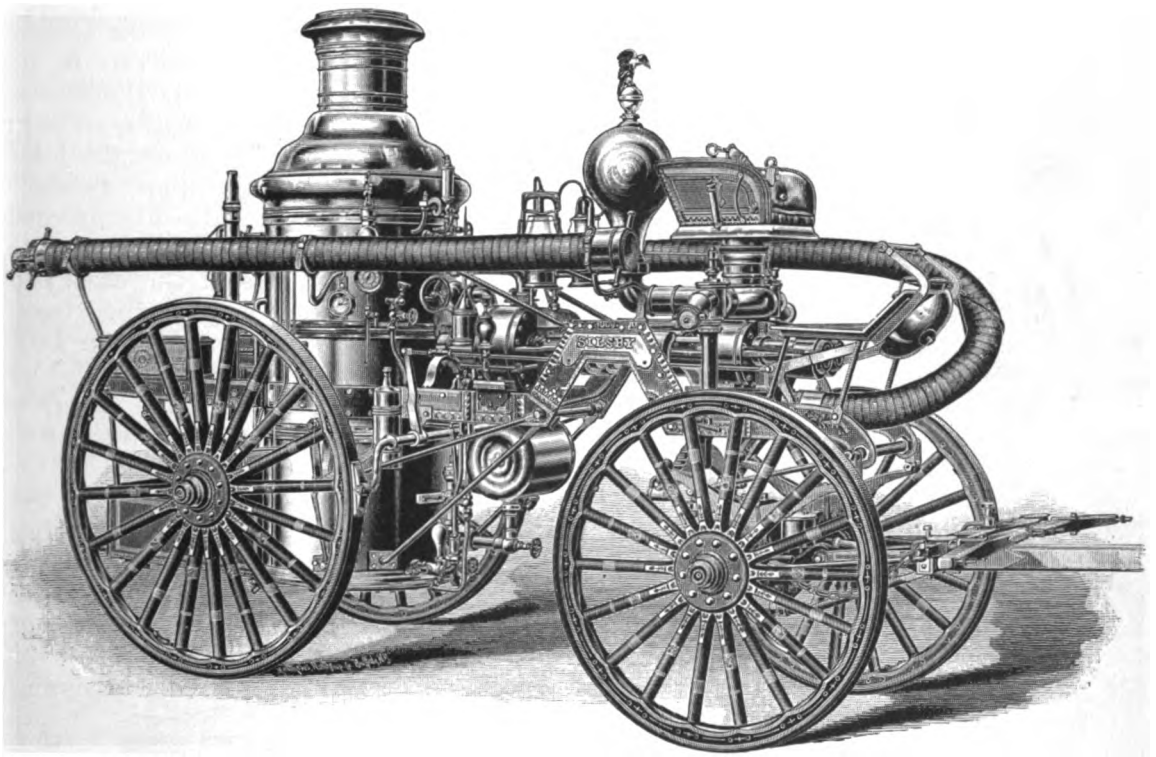

FIG. 10.

This machine is built on the rotary principle, and its peculiar features are fully explained on the following pages.

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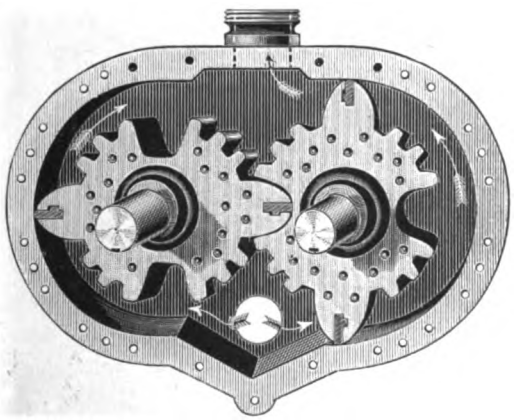
THE SILSBY ENGINE.

The steam cylinder of this engine consists of two rotary cams which work together within an elliptical steam-tight case. Live steam is admitted to the bottom of the case, and, pressing apart the long teeth, it revolves the two cams in its passage, and exhausts from the top into the stack and feed water heater. Each cam is provided with teeth adapted to mesh in recesses in the other, so that a tight joint is maintained between them, and steam is prevented from passing directly upward to the exhaust. The cams have their sides turned to fit the heads of the case, and are so adjusted that, while being steam tight, ample allowance is made for contraction and expansion due to cold and heat. Any little wear there may be after years of service can be easily taken up in a very short time.

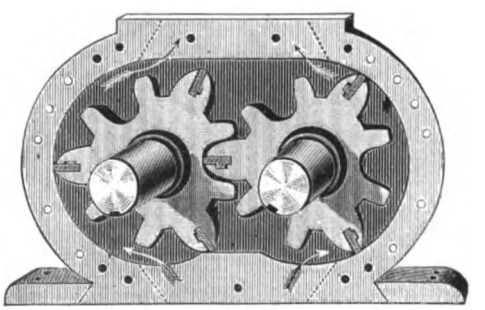


STEAM CYLINDER.

In the ends of the long teeth of the cams are placed removable packing strips, which are forced out into contact with the walls of the cylinder by springs. These packing strips can be taken out in a few minutes through openings in the sides of the case and set out, it being on the ends of these that the only wear comes.

The construction of the pump is the same as the steam cylinder, excepting that there are three long teeth in each cam, instead of two, insuring a steady flow of water.

One shaft of the pump is coupled to the corresponding shaft of the cylinder, there being outside gears on both cylinder and pump to steady the motion of the cams and equalize the pressure.



PUMP.

The water ways being large, direct, and unobstructed, anything liable to enter the suction will pass through the pump without injury or interruption in its working, and there being an entire absence of valves in this pump, leaves, sticks, sawdust, mud, and other foreign substances can be safely worked with this machine. The motion

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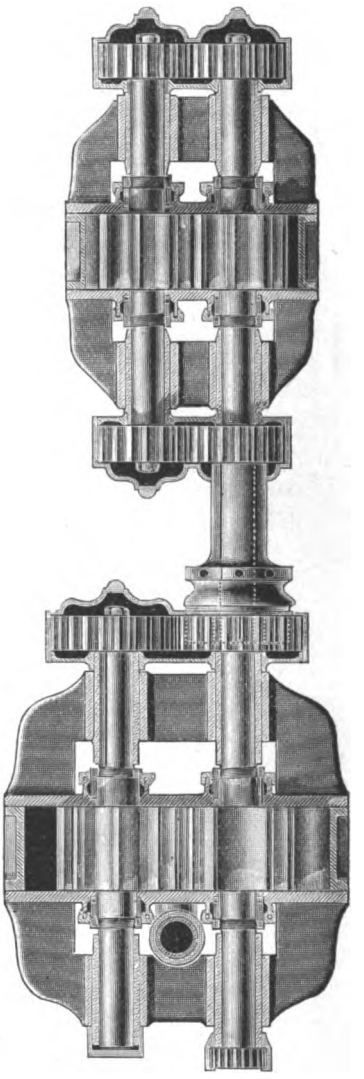
of the pump being equable, continuous, and rotary, no blows are given to the water, which enters and leaves in one steady flow, and there is, therefore, no irregular motion to the stream, nor uneven or pulsating pressure in the hose. The pump does not require priming, and will when started immediately draft water up to 29 feet vertical lift without the use of check valve. It will also force water and do good fire duty through 3,000 feet of hose or upwards, without danger of bursting the hose.



The steam cylinder and pump being on one shaft, the action is direct and continuous, and there being no loss of power between cylinder and pump, fire duty can be accomplished with low steam pressure. The machine also stands perfectly still, even when doing its heaviest fire duty, so still in fact that a glass of water may be placed on one of the wheels and not a drop be spilled. There is also an entire absence of friction on the hose.

As will be seen, in this cylinder and pump the working parts are few in number and consist entirely of metal, no leather or rubber entering into their construction. From the simplicity of this machine it is not likely to get out of order, and any one of ordinary intelligence can very soon learn to run and manage it.

The construction of the boiler is shown in the cut on page 20.

In the fire-box hang circulating water tubes arranged in concentric circles and tightly screwed into the crown sheet. These tubes are closed at their lower ends by means of wrought iron plugs welded in. Within each tube is a thinner tube open at both ends. The cooler water in the boiler descends through the thinner tube and is thus brought into the midst of the fire, where, mostly converted into steam, it ascends in the annular space between the inner and outer tubes.

The gases of combustion pass from the fire-box to the stack through smoke flues that are securely expanded at their lower ends into the crown sheet, and at their upper ends into the top head.

The circulation of water is so strong as to effectually prevent the accumulation of mud, scales, or other sediment in the drop flues or elsewhere in the boiler, depositing it in the water leg, from which it can be readily removed through suitable cleaning holes.

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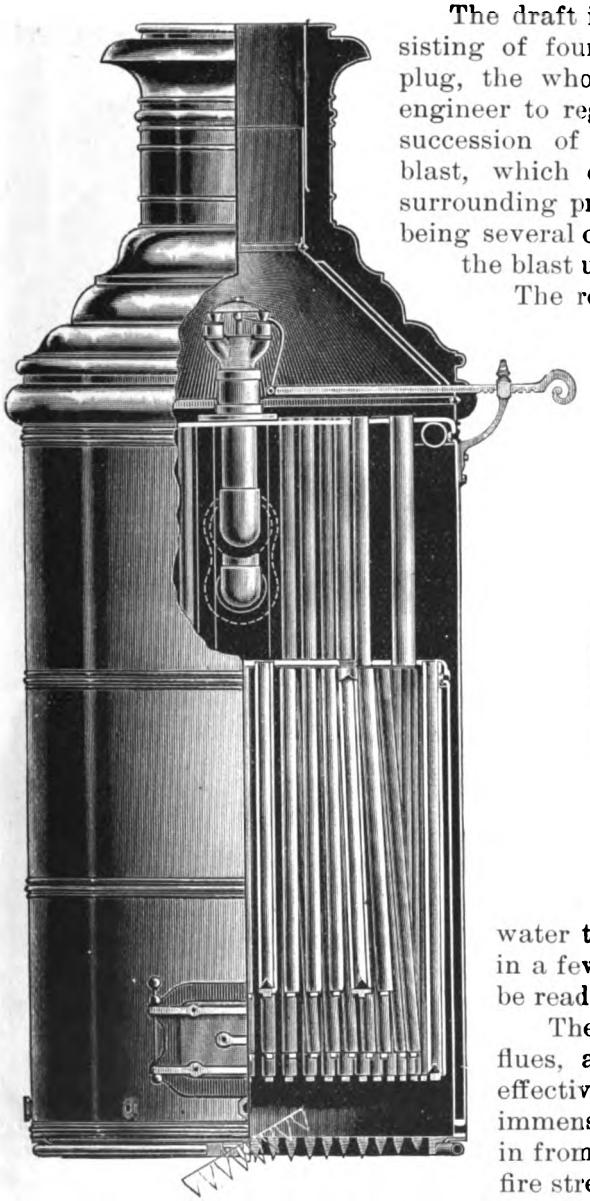
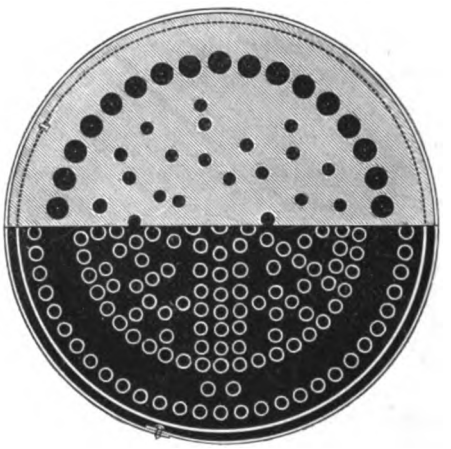
The steam, which is further heated and dried by the smoke flues, is taken from a copper pipe perforated on top, which encircles the steam space between the shell and smoke flues near their upper ends, thus insuring absolutely dry steam.



The draft is regulated by a variable exhaust, consisting of four outlets each controlled by a conical plug, the whole operated by a lever, enabling the engineer to regulate the steam pressure. The rapid succession of discharges makes in effect a steady blast, which does not pull fire and thus endanger surrounding property by throwing live coals. There being several outlets, there is also a very even pull of the blast upon the grate surface.

The ready accessibility of every part of the boiler for the purpose of making repairs is apparent, it not being necessary to tear the boiler to pieces. The



SECTION OF BOILER.

water tubes may be unscrewed and replaced in a few minutes, and all the smoke flues may be readily got at by removing the dome.

The heating surface in water tubes, smoke flues, and fire-box walls being so large and effective, the steaming power of the boiler is immense. Steam is generated from cold water in from three to five minutes; thus an effective fire stream is quickly forced.

The shell and fire-box of this boiler are made of tough and strong homogeneous steel, having a tensile strength of 60,000 pounds to the square inch, and which will neither temper nor crystallize. The tubes are double the actually required strength.

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All holes in the sheets and heads are drilled, not punched. All joints are permanently tight. All heating surfaces being straight, they are easily kept clean on both sides, and those exposed to the direct action of the fire are covered with water. The boiler will burn either coal or wood, will not prime, and salt water can be used in it if necessary.

The boiler may be fed from the main pump, but there is an independent feed pump, by which the boiler may be fed with hot water, and with fresh water while the machine is pumping salt water or that otherwise unfit for steaming.

The machine is provided with a special attachment whereby the feed water, supplied from a tank, is heated to a temperature of about 212 degrees F., using for this purpose exhaust steam from the cylinder.

Our patented form of stuffing boxes, used in both steam cylinder and pump, are self-adjusting, reduce friction, insure such absolute tightness that there is not a particle of leakage of either steam or water, and do away with the necessity of frequent repacking. There is also a special patented form of boxing, entirely preventing overheating of the journals with any long continued service or from neglect.

These machines are built "crane-neck" style. The larger sizes, or those intended to be drawn exclusively by horses, are hung on platform springs in front and half elliptic springs in the rear, and have a brake operated by the driver's foot, as shown in cut on page 17.

As an illustration of the work that is capable of being performed with these engines, we give below the results accomplished in a trial of a second size Silsby machine at New Haven, Conn.

Test No. 1—Engine started in 5½ minutes.

Test.	Number of Streams.	Hose, Feet, Each Line.	Nozzles, Inches.	Pressures, Pounds.		Distances, Feet.	
				Steam.	Water.	Horizontal.	Vertical.
2	1	200	*1¼	122	245	278	195
3	1	350	1¼	118	275	274	
4	1	150	1¼	125	224		210
5	2	100	1	124	194	240	170
6	1	100 siamesed	1½	120	165	260	160
7	1	100 siamesed	1¾	122	142	250	150
8	4	150	⅞	123	130	195	140
9	1	1,500	1	118	255	165	
10	1	50 siamesed	1¼	123	200	319	215

* Pipe on top of City Hall tower at elevation of 160 feet.

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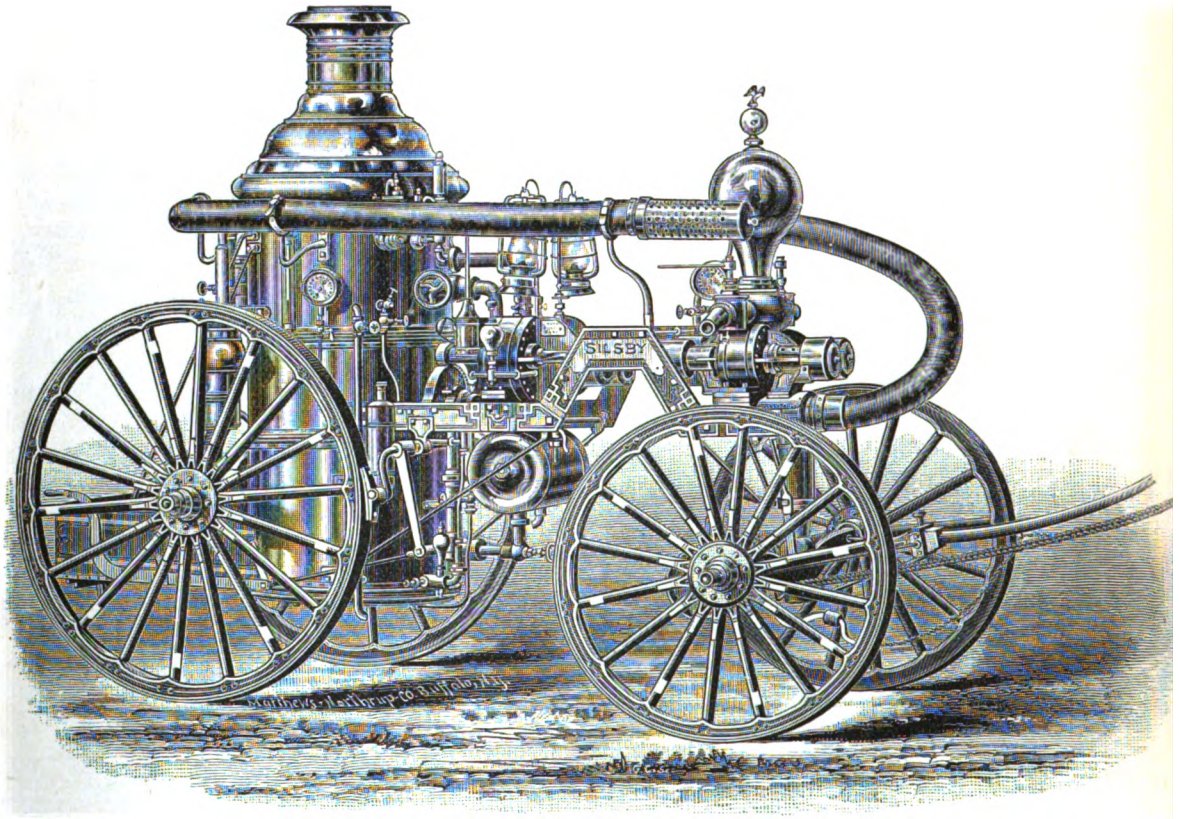

FIG. 20.

The above cut represents the smaller sizes of this engine. They are hung on spiral springs front and rear and have a "combination pole," suitable for horse or hand draft, with driver's seat and drag rope and reel, the brake being operated from fuel pan in the rear.

This style of engine is adapted to work on uneven ground, and may be run on a side hill or any of the other similar situations met with in small towns in taking water from a stream or pond.

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CLAPP & JONES STEAM FIRE ENGINE.

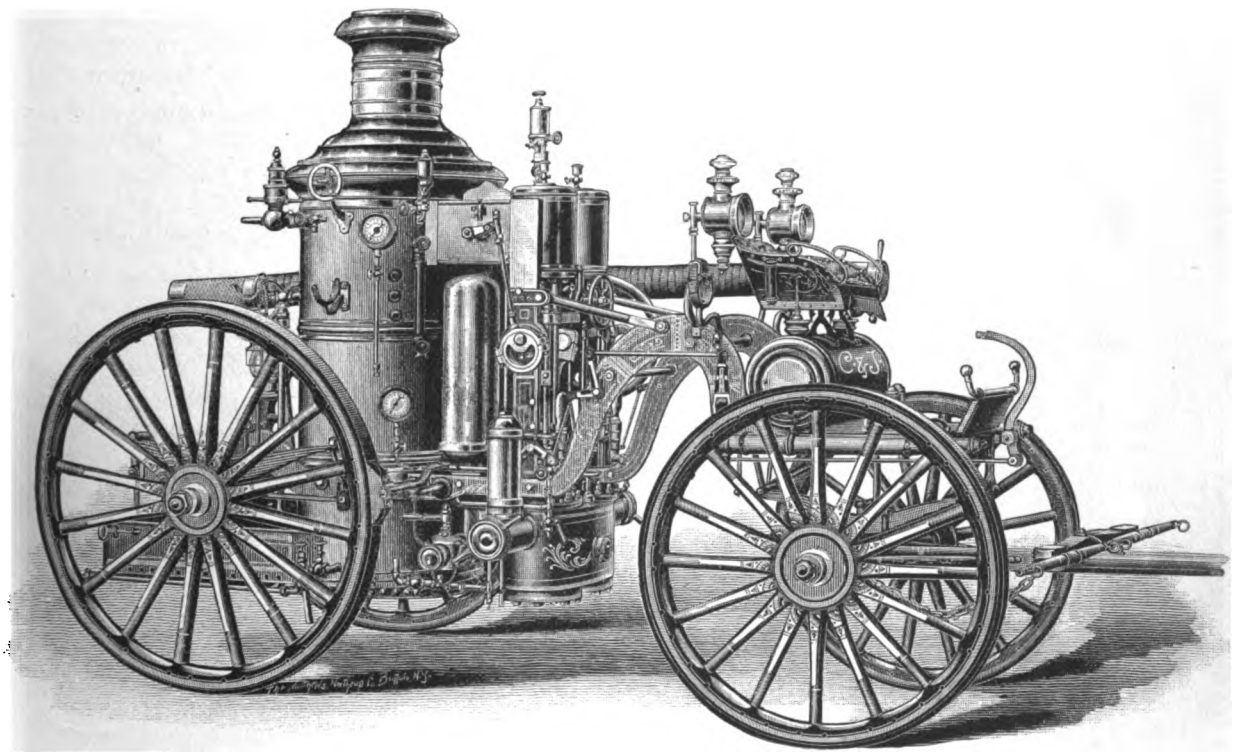

FIG. 15.

This machine is known as a piston engine, and the description that follows will show the manner in which it is built, as well as its special features.

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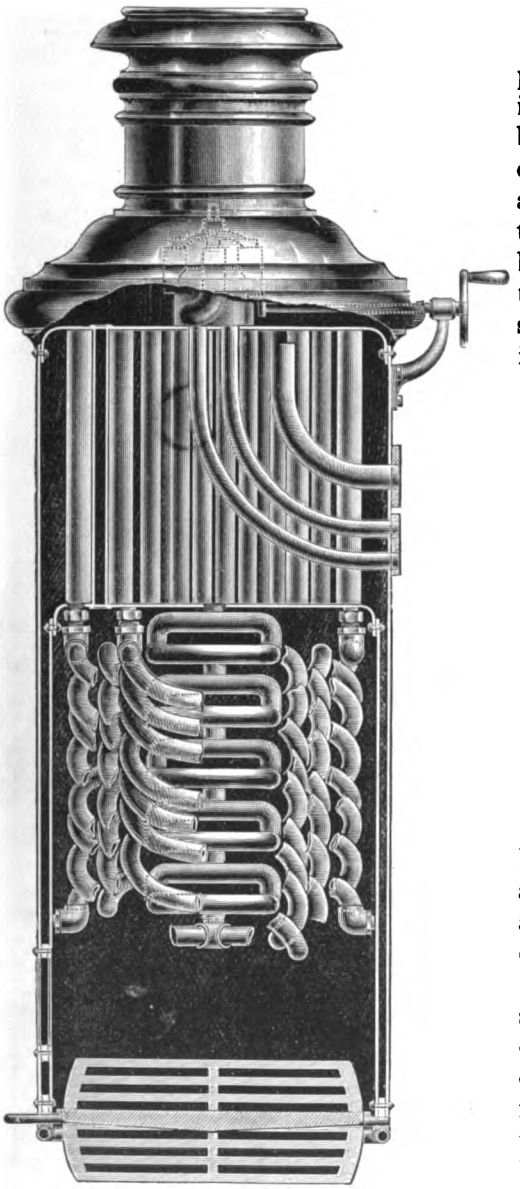
THE CLAPP & JONES ENGINE.



This engine is constructed with Clapp's patent coil-tube boiler, with our patented improvements. The special feature of the boiler consists of spiral coils of water-circulating tubes, which are ingeniously arranged within the fire box in such a way that the circulation produced conforms harmoniously with the laws which govern the action of steam, thus insuring not only safety, but also the greatest possible steaming efficiency.

These spiral coils are made from seamless copper tubing, and their form permits a free expansion and contraction from heat and cold without causing them to strain any of the steam joints.

The spiral pitch or bend of each tube is sufficient to permit of the use of five others of same diameter, so there are in each circular row six of these coil tubes, the number of rows, as well as the diameter of the tubes, depending upon the size of the boiler.

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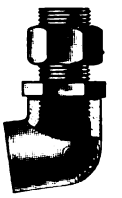
Each coil tube is connected at its upper end with the crown sheet and at its lower end with the fire-box wall, so that the water in circulating always flows over the crown sheet, thereby preventing its becoming overheated. The connections at ends of tubes are carefully made, by means of jam nuts and corrugated copper washers, so as to insure absolute tightness, and at the same time admit of the tubes being readily removed in case of repairs.



TOP CONNECTION.

The advantages of these spiral coil tubes over any other form, such as straight tubes or a cluster of the same, are numerous. The circulation is more perfect and the heating surface is more effective ; a longer tube can be used, and there is abundant freedom for expansion and contraction.

The working of the boiler may be explained as follows: The fire being started in the fire-box, almost immediately the water in the coil tubes becomes warm and begins to circulate from natural causes, the heated water passing up into the steam drum, and the cooler water from the leg and drum taking its place, the whole being quickly heated to the steam-making temperature. At this point pressure begins to show, and increases very rapidly, since the circulation is constantly maintained and the water is all at the same high temperature.

While it is preferable, of course, to carry the water a few inches above the crown sheet, as a more uniform pressure of steam may be maintained, which is always desirable, yet the limit of safety is not reached until the water is nearly all out of the boiler, or lower than the coil connections in water leg. Even with the level of water below this point the only danger would be from possible injury to the coil tubes, resulting from excessive heat while the tubes were unprotected by water.

BOTTOM CONNECTION.

Although these coil tubes are rolled spirally to as small a size as possible, there is still left a space of considerable diameter in the center of the fire-box. The tendency of this space, if left unoccupied, would be to act as a flue, causing an excessive amount of heat to pass up through the central fire tubes, resulting in their undue expansion as compared with the other tubes and loosening the joints of the latter in the top head.

FIRE DEFLECTOR.

To overcome this difficulty, as well as to effect a more uniform passage of heat through the fire tubes, direct the gases of combustion in more effective contact with the coiled water tubes, and at the same time provide additional water circulation passages and heating surface in the hottest part of the fire-box, we have devised an improved water-circulating fire deflector, adapted to occupy the space in the center of the fire-box, within the coil tubes.

The design of this water-circulating fire deflector is clearly shown in the illustration of boiler. It consists of a number of sections, as shown in the above cut, which are connected in series vertically so as to reach from the crown sheet, into which the deflector is screwed, to the bottom of the spiral coils, where connection is made with the water leg of the boiler.

Extending from the crown sheet to the top head are the smoke flues or fire tubes, securely expanded at both ends, through which the gases of combustion pass from the fire-box to the smoke stack, and which also serve to superheat the steam.

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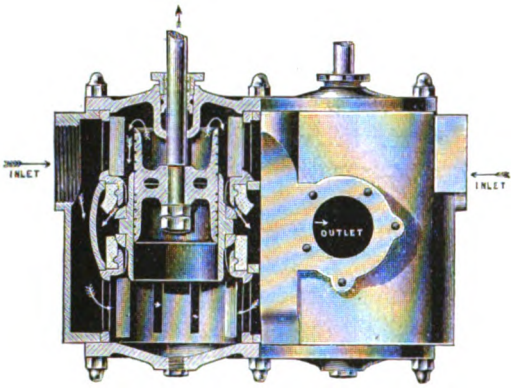
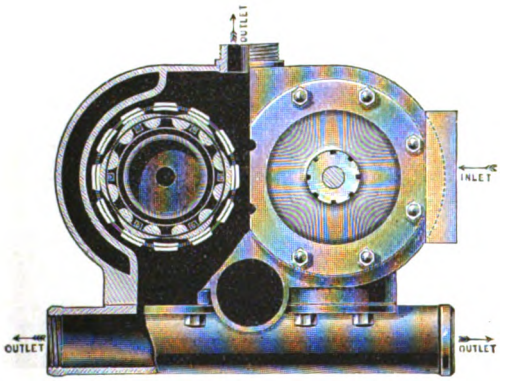
This boiler possesses decided advantages over most others when connected with a heater, owing to its perfect circulation. With fire in the fire-box the circulation of water is from the leg up through the coil tubes and deflector to the steam dome, but when attached to a heater the circulation is directly opposite. The hot water pipe or outlet from the heater enters the boiler at about the water line, or just above the crown sheet. The heated water is carried over the crown sheet, and passes through the coil tubes and deflector into the leg of the boiler, to replace the cooler water that flows to the heater, the pipe that serves as the outlet to the boiler and inlet to the heater being connected near the bottom of the water leg. It will thus be seen that the water may be moving in proportion to the heat imparted to it, and with a suitable heater any desired temperature can be maintained. All of the water in the boiler being at a uniform degree of heat, a working pressure of steam may be generated very quickly upon starting fire in the fire-box.





The boiler, both sheet and fire-box, is made of the very best homogeneous steel boiler plate, and is properly stayed and riveted.

The pump is of novel construction, and the arrangement and proportions of its parts are such, and the displacement by the plunger so large as compared to the space between it and the valves, that it will lift water to a very great height. The pump, as well as pins, rods, etc., is made entirely of composition metal (copper and tin), having a high tensile strength, and there are no iron parts to rust. The pump is also so constructed as to require no leather or other forms of packing, so that the plunger is free from friction. It is self packed, and at the same time frictionless in its working; thus a high water pressure may be maintained and the machine run at a high rate of speed for a long period, with no danger to be apprehended from the cutting or blowing out of packing.

The pump heads are merely cages, fitted with inlet and outlet valves of simple form of construction. There is no necessity for spiral springs or other device to bring the valves back to their places, their own elasticity being sufficient to quickly and firmly seat them, so there is no loss of motion in their working. The character of the openings in the head, together with the form and lift of the valves, insures great ease in the flow of water into and out of the pump. If from any cause it is desired to remove the valves it can be easily and quickly done, less than five minutes being required to do the work.

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All of the packed joints are so made that the packing is not damaged by taking the pump apart. It is held in place by a dove-tailed form of groove, to which it is carefully fitted, and will last for years if simply let alone.

There are only two pieces in this pump that have any surface that can be worn even by the most severe usage, and these can be taken out and replaced without disturbing the pump. This can be done quickly and at very small cost, and when done, no matter how long the pump may have been in use, it is as good for work as when new.

The machinery is so arranged that the connections between the steam cylinders and pumps are direct through piston rods and not by means of cranks and connecting rods. The friction is no greater when doing hard work than when the work is light. These machines are so constructed that the center line of pressure comes in the center of the frame work, affording great strength with a minimum weight of material.

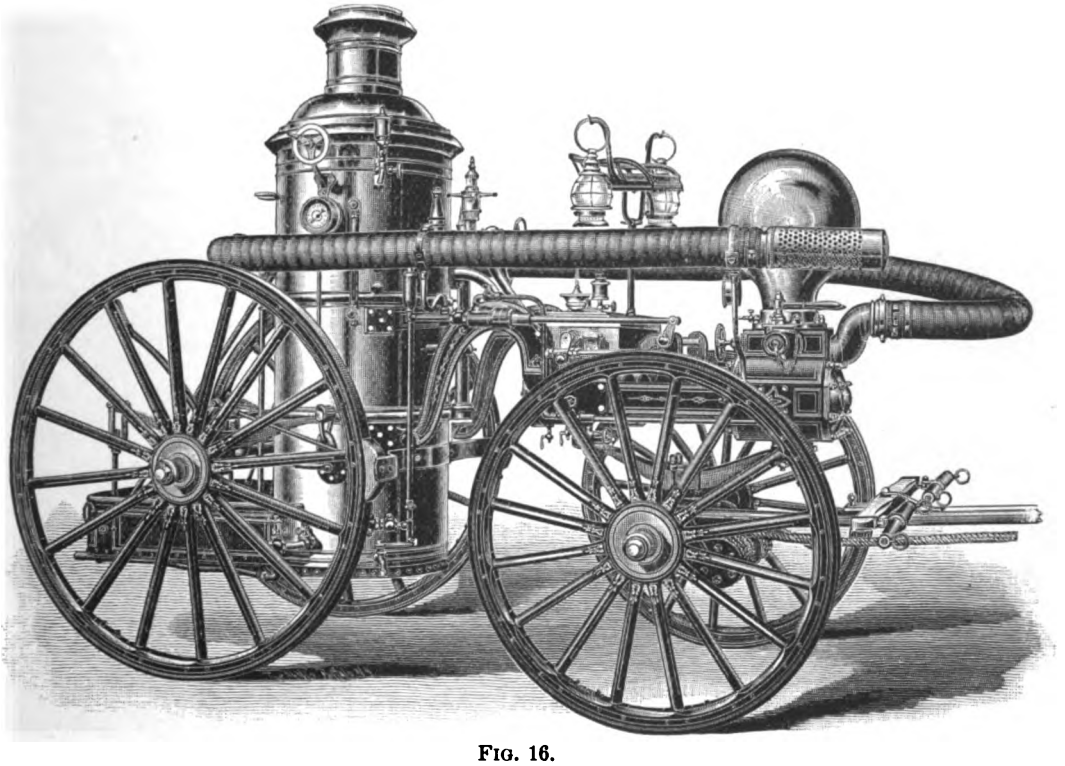

FIG. 16.

This engine is built in all cases with double cylinders and pumps, the larger machines having the pumps and cylinders vertical, while in the smallest size they are arranged horizontally, as shown in above illustration.

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BUTTON STEAM FIRE ENGINE.

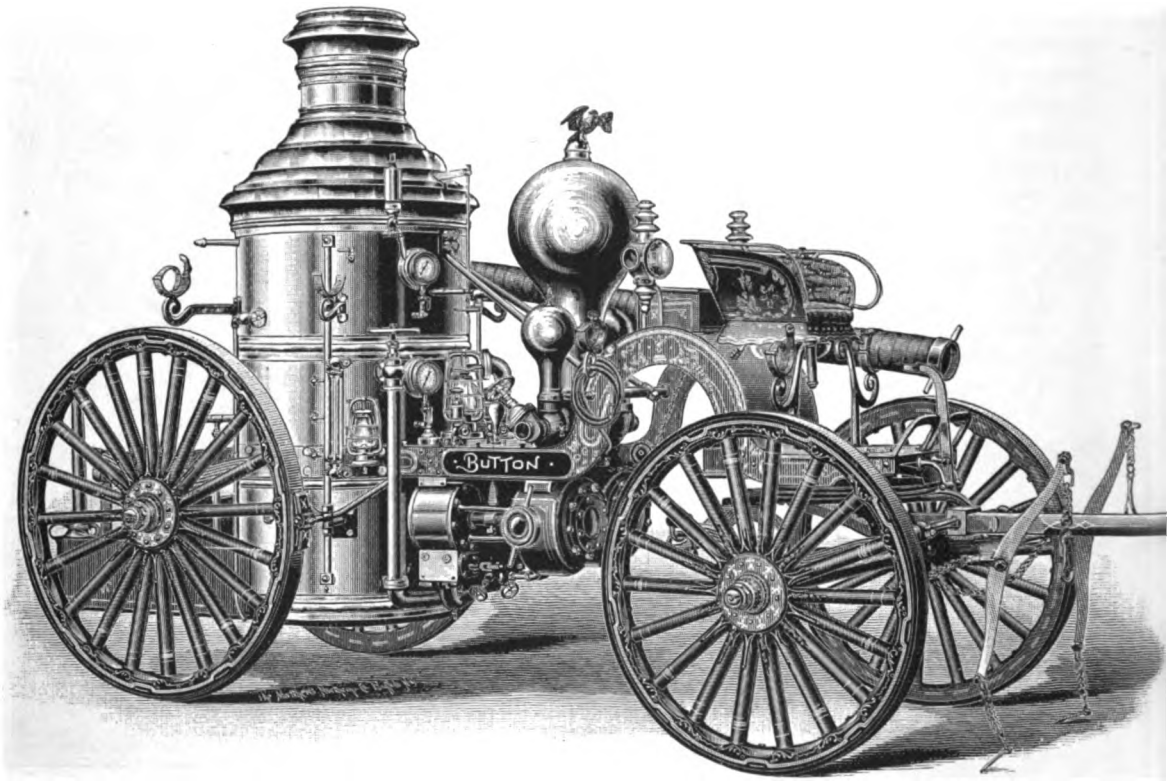

FIG. 25.

This is a piston engine, the above illustration representing the machine as constructed with double cylinders and pumps. It is also built with single pump and cylinder.

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THE BUTTON ENGINE.

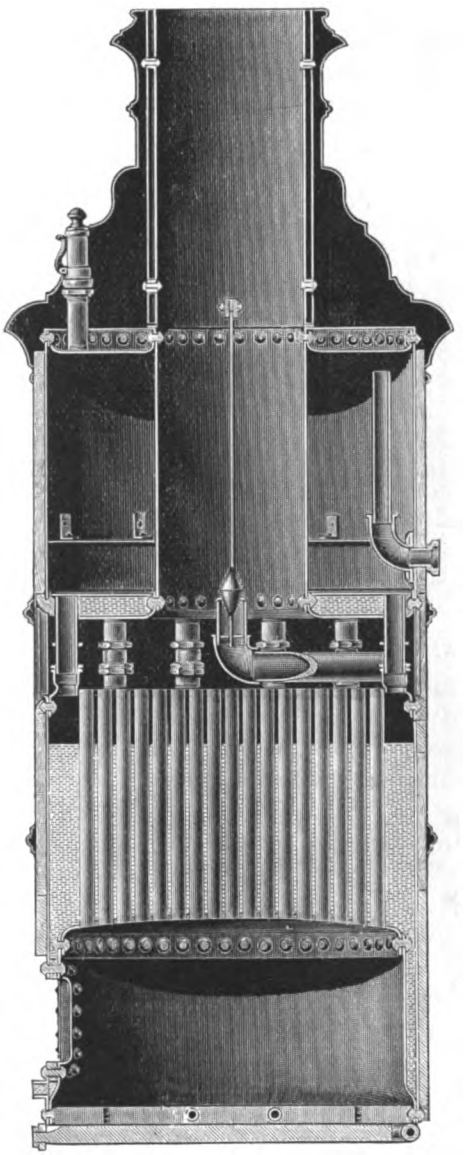
The boiler of this machine is an upright tubular, with submerged combustion chamber. The flues are of pure copper, and the steam chamber and smoke flues are so arranged as to avoid all difficulty arising from the unequal expansion of iron and copper when heated, thus preventing leaky flues.

The boiler can be taken apart and put together without removing rivets or breaking packed joints. The flue sheets are so formed and arranged that all scale deposits or mud sediment, which are always to be found in boilers, are driven by the heat into the leg of the boiler, where they can be removed through the cleaning holes. The flues are securely held at both ends in heavy head sheets, and they are protected from injury by the outside shell of the boiler, and are always covered with water.

The pumps used in this machine are cast in a single piece, without packed partitions, are made of the best bronze metal, and the water nowhere comes in contact with iron. The water ways are direct and large.

The valves are on bronze seats easily separated from the pump casting, and are readily accessible for inspection or repair. They are of rubber with bronze bushings, and are of the size and proportion best adapted for the purpose, and do not stand in the water when not in use.

The cuts (Fig. 1 horizontal section, Fig. 2 vertical cross-section) represent the pump. A is the plunger; B, plunger rod connecting with steam piston; C, packing in which plunger works; D, follower for plunger packing; E, screw to tighten plunger packing; F,



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front head of pump; G, back head of pump; H, brace uniting pump head to steam cylinder; I, suction water way; J, suction valve water passages; K, suction valves; L, discharge valves; M, valve stems; N, discharge valve water passages; O, stops to hold valve stems in place; P, packing for piston rod; S, valve springs; U, flange to which air chamber is bolted; V, stops for discharge valve stems; W, bolt to hold stop V; X, boiler feed pump; Y, churn valve; Z, openings to vacuum chamber.

The double pumps on this machine are made by casting two pumps in one piece side by side, having no packed partitions, and are fitted in exactly parallel lines to two steam cylinders with adjacent heads in one piece, so they cannot be put out of

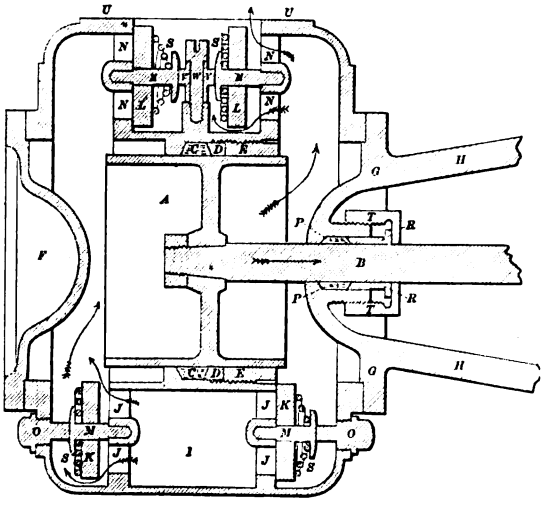

FIG. 1.

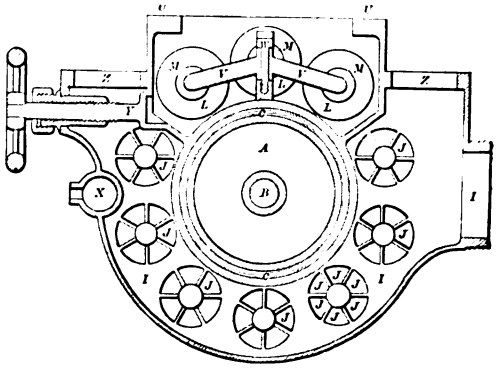

FIG. 2.

line. This renders the parts of the engine practically a unit, and free from the chance of becoming disabled by accident to running gear, expansion from heat, or strain from pressure. The steam chest and ports are under the cylinders, so as to completely drain them of the water of condensation, and each steam valve is moved by the opposite piston by means of a direct lever, without the intervention of balance wheels, crank shaft, link block, connecting rods, eccentrics, gearing, or any revolving parts. All the movable parts of the engine are reciprocating; and, being fitted up in the best manner, they move with mathematical precision, running noiselessly, without concussion, oscillation, or jar, and they have no "dead center." In short, they have no machinery except the straight piston and valve rods, and the steam valve is balanced so that it moves as easily with 100 pounds of steam as when it is empty.

The proportions of the pump are such that the frictional surface and speed of the pistons are small for the work accomplished. Every packing and bearing can be set up and tightened when worn. The engine proper forms no part of the running gear frame, but is complete in itself.

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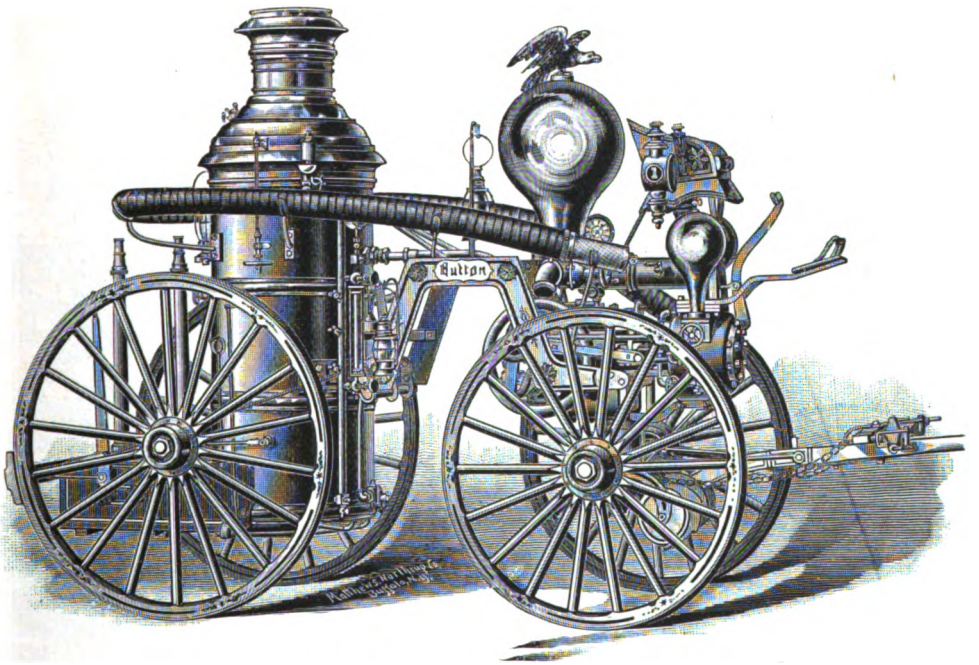

FIG. 26.

The above cut shows the Button engine as constructed with single cylinder and pump, and adapted to be drawn by either horses or men.

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COLUMBIAN STEAM FIRE ENGINE.

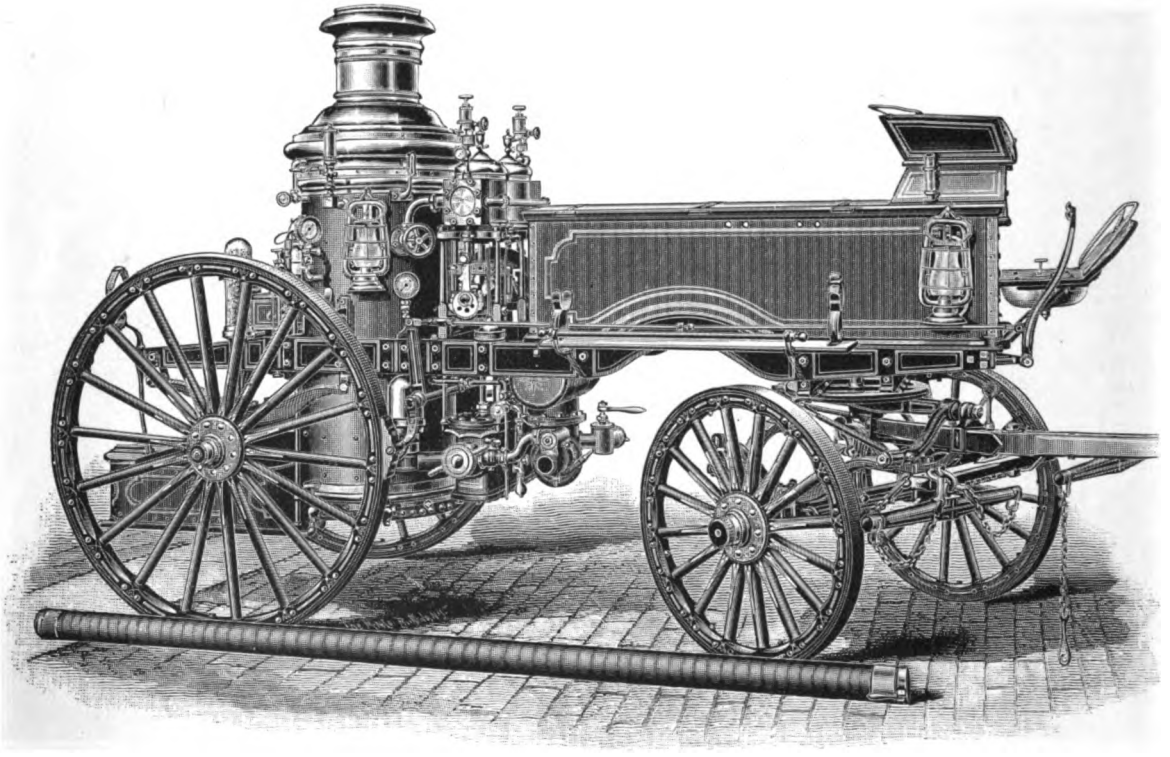

FIG. 7.

This machine is one of our recent inventions, and consists of a steam fire engine and hose wagon combined. The accompanying description explains its advantages.

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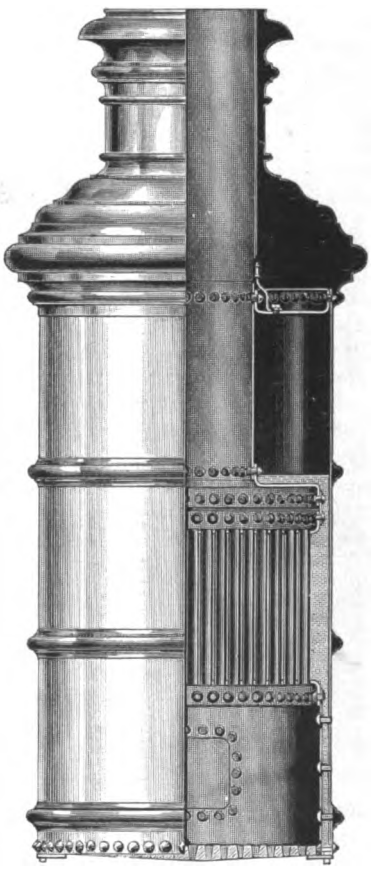
THE COLUMBIAN ENGINE.

This engine has been designed for service in the suburban fire stations of large cities, but is equally well adapted for use in the smaller towns. Combining as it does two distinct pieces of apparatus in one, it possesses advantages that will at once commend it to those engaged in the fire service. The machine is light and easily handled on ordinary country roads, and is provided with every convenience that experience could suggest.



The boiler, represented in the accompanying cut, is of the well-known submerged-flue style, but is of improved construction. In designing this boiler we have endeavored to avoid the disadvantages attending the ordinary boiler of this type hitherto used on steam fire engines.

One of the most serious objections to this class of boilers has been that the flues being only partially covered with water, there was a very unequal expansion, and consequently loosening of joints; and another is that, when repairs were required, it has been necessary to tear the old style flue boiler to pieces in order to get at the flues for renewal or other purposes, a job not only expensive but occupying a very long time.

It will be seen that in our improved submerged flue boiler we have entirely overcome these difficulties, and that we have produced a boiler with perfect circulation, large heating surface, tight at all times, simple of construction, and with a ready accessibility of parts.

This boiler is made of the best homogeneous steel, and properly stayed, insuring great strength. The flues are made of seamless copper, and are so arranged that any single tube can be taken out without removing the boiler head. The flues are screwed into the upper head or sheet and rolled into the lower sheet. *The flues are entirely submerged at all times,* thus preventing unequal expansion, and consequently leaky joints, and there is no formation of scale on them. Its durability

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is greatly enhanced, not only by this form of construction, but by its having no part subjected to heat without being fully protected by water.

These boilers can be furnished in any size, and are admirably adapted for use on any steam fire engine.

This engine is built with double cylinders and pumps of the Ahrens type, the latter being provided with the Wilcox patent valve, elsewhere illustrated and described. When specially ordered, the engine will be constructed with the Ahrens coil boiler, or with any other type of boiler which we manufacture.

The hose box has capacity for carrying from 600 to 1,000 feet of rubber-lined cotton fire hose, and is supplied with suitable rollers for running out the hose. When the hose-box is closed, as shown in the cut, it may be used as a seat for the firemen, and as many as ten men can ride on the engine if desired.

The machine is hung on platform springs in front and half elliptic springs in the rear, and is fitted to be drawn by horses, or by horses or men, as preferred.

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STEAM FIRE ENGINE REFERENCES.

ABOUT 2,000 ENGINES OF OUR MANUFACTURE ARE NOW IN SERVICE.

Purchasing committees and others desiring to investigate with regard to the merits of our engines are respectfully referred to the following cities, towns, etc., having them in use. Cities where there are five or more engines of our make in service are printed in heavy type. Opposite the name of each place we give the kind of engines in use and made by us, and also the year in which its first engine of our manufacture was built.

Abbeville, La.	Silsby	1891
Ada, Ohio.	Silsby	1874
Adrian, Mich.	Silsby	1865
Aiken, S. C.	Button	1880
Akron, Ohio.	Ahrens, Silsby, Button	1866
Alameda, Cal.	Clapp & Jones	1891
Albany, Ga.	Silsby	1870
Albany, N. Y.	Clapp & Jones, Button	1864
Albany, Oreg.	Clapp & Jones	1875
Albina, Oreg.	Clapp & Jones	1891
Albion, Mich.	Silsby	1878
Alexandria, La.	Silsby	1881
Alexandria Bay, N. Y.	Silsby	1887
Algiers, La.	Silsby	1885
Allegheny, Pa.	Silsby	1884
Allentown, Pa.	Silsby	1865
Alliance, Ohio.	Silsby	1873
Alma, Colo.	Silsby	1882
Alma, Wis.	Silsby	1888
Almonte, Ont., Can.	Button	1884
Alpena, Mich.	Silsby, Clapp & Jones	1875
Alton, Ill.	Ahrens	1871
Altoona, Pa.	Silsby	1893
Amboy, Ill.	Silsby	1871
Amoskeag Lumber Co., Amoskeag, Ga.	Silsby	1876
Amsterdam, N. Y.	Button	1871
Anaconda Smelting Co., Anaconda, Mont.	Silsby	1887
Anacortes, Wash.	Ahrens	1892
Anderson, S. C.	Clapp & Jones	1884
Andover, Ohio.	Silsby	1875
Annapolis, Md.	Silsby	1884
Ann Arbor, Mich.	Button	1880
Anoka, Minn.	Silsby	1878
Antigo, Wis.	Clapp & Jones	1887
Arcanum, Ohio.	Ahrens	1885
Arnprior, Ont., Can.	Button	1888
Ashland, Ohio.	Silsby	1867
Ashtabula, Ohio.	Ahrens, Clapp & Jones	1873
Astoria, Oreg.	Silsby, Clapp & Jones	1877
Atchison, Kans.	Silsby	1873
Athens, Ga.	Button	1876
Athens, N. Y.	Clapp & Jones	1871
Athol, Mass.	Clapp & Jones	1893
Atlanta, Ga.	Clapp & Jones	1893
Atlantic City, N. J.	Silsby, Clapp & Jones	1881
Atwater, Minn.	Clapp & Jones	1890
Auburn, Ind.	Ahrens	1885
Augusta, Ga.	Silsby, Button	1866
Aurora, Ill.	Button	1875
Aurora, Ind.	Ahrens	1876
Austin, Tex.	Silsby	1871
Avoca, Iowa.	Button	1883

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Bakersfield, Cal.	Silsby Clapp & Jones	1872
Baldwinsville, Mass.	Silsby	1891
Baldwinsville, N. Y.	Silsby	1875
Ballard Vale, Mass.	Silsby	1886
Baltimore, Md.	Silsby Clapp & Jones	1883
Barnesville, Ga.	Clapp & Jones	1879
Barre, Mass.	Button	1885
Bath-on-the-Hudson, N. Y.	Button	1866
Battle Creek, Mich.	Ahrens Button	1863
Bay City, Mich.	Silsby	1865
Bayonne, N. J.	Silsby Clapp & Jones Button	1885
Beaufort, S.C.	Silsby	1871
Beaver Falls, Pa.	Silsby	1875
Bedford, Pa.	Silsby	1872
Bellefontaine, Ohio.	Silsby	1875
Bellefonte, Pa.	Silsby Clapp & Jones	1875
Belleville, Ill.	Ahrens	1876
Belleville, Ont., Can.	Button	1866
Belle Plaine, Iowa.	Ahrens	1891
Bellevue, Ohio.	Silsby	1875
Bellows Falls, Vt.	Silsby	1886
Belmar, N. J.	Button	1868
Bennington, Vt.	Silsby	1871
Benton Harbor, Mich.	Silsby	1876
Berkley, Va.	Clapp & Jones	1890
Berlin, Ont., Can.	Silsby	1873
Berlin, Wis.	Silsby	1886
Bethlehem, Pa.	Clapp & Jones	1873
Billerica, Mass.	Silsby	1891
Binghamton, N. Y.	Silsby	1862
Birmingham, Ala.	Ahrens	1886
Blissfield, Mich.	Clapp & Jones	1876
Bloomington, Ind.	Silsby	1871
Bloomsburg, Pa.	Silsby	1877
Blossburg, Pa.	Silsby	1877
Boise City, Idaho.	Silsby	1879
Boonville, N. Y.	Silsby	1882
Boston, Mass.	Silsby Clapp & Jones	1858
Boyertown, Pa.	Silsby	1873
Bozeman, Mont.	Silsby	1888
Bradford, Mass.	Silsby	1882
Bradford, Pa.	Silsby	1881
Brattleboro, Vt.	Clapp & Jones	1876
Brazilian Government, Brazil.	Clapp & Jones	1883
Brenham, Tex.	Silsby	1879
Brewer, Me.	Button	1883
Brewster, N. Y.	Silsby	1886
Bridgeton, N. J.	Silsby	1877
Bridgton, Me.	Silsby	1887
Bridgewater, Mass.	Silsby	1883
Bristol, Pa.	Silsby	1872
Brockport, N. Y.	Silsby	1877
Brockton, Mass.	Silsby	1881
Brooklyn, Iowa.	Silsby	1874
Brooklyn, N. Y.	Clapp & Jones	1885
Buchanan, Mich.	Silsby	1876
Bucyrus, Ohio.	Silsby	1869
Buffalo, N. Y.	Silsby Button	1859
Burlington, Vt.	Silsby Button	1867
Burlington, Iowa.	Silsby	1867
Cadiz, Ohio.	Silsby	1872
Cairo, Ill.	Silsby	1865
Calais, Me.	Button	1872
Callao, Peru.	Silsby	1884
Calumet, Mich.	Clapp & Jones	1875
Cambridge, Md.	Silsby	1882
Cambridge, Ohio.	Silsby	1873
Cambridge City, Ind.	Ahrens	1876
Camden, N. J.	Clapp & Jones Button	1890
Camden, S. C.	Silsby	1871
Campello, Mass.	Silsby	1881
Canajoharie, N. Y.	Button	1872
Canal Dover, Ohio.	Silsby	1874
Canal Fulton, Ohio.	Silsby	1873
Canandaigua, N. Y.	Silsby Button	1870
Canastota, N. Y.	Clapp & Jones	1876
Canton, Ill.	Silsby	1874
Canton, Mass.	Silsby	1885
Canton, N. Y.	Silsby	1882
Canton, Ohio.	Ahrens	1888
Cape May, N. J.	Silsby	1879
Cardenas, Cuba.	Silsby	1889
Cardington, Ohio.	Silsby	1874
Carlisle, Pa.	Silsby Button	1870
Carrollton, La.	Silsby	1887
Carrollton, Mich.	Clapp & Jones	1887
Carson City, Nev.	Silsby	1873
Carthage, N. Y.	Silsby	1875
Casa de Moneda, City of Mexico, Mex.	Silsby	1878
Castleton, N. Y.	Clapp & Jones	1871
Catasauqua, Pa.	Silsby Button	1866
Catasauqua Mfg. Co., Ferndale, Pa.	Button	1890

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Catlettsburg, Ky.	Ahrens	1884
Catskill, N. Y.	Clapp & Jones	1872
Cedarburg, Wis.	Ahrens	1885
Cedar Rapids, Iowa.	Silsby	1869
Cedarville, Ohio.	Silsby	1888
Centralia, Wash.	Ahrens	1890
Centreville, Ind.	Silsby	1875
Chariton, Iowa.	Silsby	1877
Charleston, S. C.	Silsby, Clapp & Jones, Button	1866
Charleston, W. Va.	Silsby	1871
Charlestown, W. Va.	Button	1871
Charlevoix, Mich.	Silsby	1877
Charlotte, Mich.	Silsby	1872
Charlotte, N. Y.	Silsby	1889
Charlottetown, P. E. I., Can.	Silsby	1875
Chaska, Minn.	Silsby	1870
Chatham, Ont., Can.	Clapp & Jones	1871
Chattanooga, Tenn.	Ahrens	1875
Chelsea, Mass.	Silsby	1882
Chester, Pa.	Silsby	1874
Chester, Vt.	Clapp & Jones	1889
Cheyenne, Wyo.	Silsby	1868
Chicago, Ill.	Ahrens, Silsby, Button	1858
Chicago, Burlington & Quincy R. R. Co.	Clapp & Jones	1872
Chillicothe, Ohio.	Ahrens, Silsby, Clapp & Jones	1867
Chilton, Wis.	Clapp & Jones	1892
Chippewa Falls, Wis.	Silsby	1870
Cienfuegos, Cuba.	Silsby	1882
Cincinnati, Ohio.	Ahrens	1852
Circleville, Ohio.	Silsby, Clapp & Jones	1867
City Island, N. Y.	Clapp & Jones	1890
Claremont, N. H.	Silsby	1884
Clarksville, Tenn.	Ahrens	1872
Clayton, Ala.	Silsby	1884
Clayton, N. Y.	Silsby	1887
Cleveland, Ohio.	Ahrens, Silsby, Clapp & Jones	1863
Clinton, Iowa.	Silsby	1867
Clintonville, Wis.	Clapp & Jones	1886
Clyde, N. Y.	Silsby	1873
Clyde, Ohio.	Clapp & Jones	1878
Coatesville, Pa.	Clapp & Jones	1877
Coaticook, Que., Can.	Silsby	1887
Coeymans, N. Y.	Silsby	1868
Cohoes, N. Y.	Silsby, Button	1867
Coldwater, Mich.	Silsby	1872
Colfax, Wash.	Silsby	1883
Collingwood, Ont., Can.	Silsby	1871
Columbia, Pa.	Clapp & Jones	1876
Columbia, S. C.	Silsby, Clapp & Jones	1871
Columbia City, Ind.	Clapp & Jones	1877
Columbus, Ga.	Silsby, Clapp & Jones	1870
Columbus, Miss.	Silsby, Clapp & Jones	1872
Columbus, Ohio.	Ahrens, Silsby	1870
Concord, N. H.	Silsby	1882
Conemaugh, Pa.	Silsby	1881
Corpus Christi, Tex.	Silsby	1873
Corry, Pa.	Silsby	1870
Cortland, N. Y.	Silsby	1876
Corunna, Mich.	Clapp & Jones	1887
Cottage City, Mass.	Button	1884
Council Bluffs, Iowa.	Ahrens, Silsby	1868
Covington, Ky.	Ahrens	1876
Coxsackie, N. Y.	Button	1871
Crisfield, Md.	Clapp & Jones	1886
Crystal Plate Glass Co., Crystal City, Mo.	Ahrens	1881
Cynthiana, Ky.	Ahrens	1876
Dallas, Tex.	Ahrens, Silsby	1874
Dallas Compress Co., Selma, Ala.	Silsby	1869
Danielsonville, Conn.	Silsby	1878
Danbury, Conn.	Clapp & Jones	1892
Danvers, Mass.	Button	1865
Danville, Ill.	Silsby	1872
Danville, Pa.	Silsby	1871
Danville, Va.	Button	1883
Darien, Ga.	Silsby	1883
Darlington, S. C.	Silsby	1885
Dartmouth, N. S., Can.	Silsby	1878
Davenport, Iowa.	Button, Clapp & Jones	1866
Dawson, Ga.	Silsby	1885
Dayton, Ohio.	Ahrens, Silsby	1863
Dayton, Wash.	Silsby	1882
Decatur, Ill.	Ahrens	1891
De Graff, Ohio.	Silsby	1880
Delaware, Ohio.	Silsby	1870
Delphos, Ohio.	Ahrens	1881
Denver, Colo.	Ahrens, Silsby	1881

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De Pere, Wis.	Clapp & Jones	1872
Deshler, Ohio.	Ahrens	1887
Detroit, Mich.	Ahrens Silsby	1883
Dexter, N. Y.	Silsby	1877
Donaldsonville, La.	Silsby	1882
Dover, N. J.	Clapp & Jones	1885
Dowagiac, Mich.	Button	1886
Downingtown, Pa.	Silsby	1892
Dresden, Ont., Can.	Silsby	1879
Du Bois, Pa.	Silsby	1888
Du Bois, John E., Du Bois, Pa.	Silsby	1888
Dubuque, Iowa.	Ahrens Silsby	1867
Duluth, Minn.	Ahrens Silsby Clapp & Jones	1870
Durand, Wis.	Silsby	1876
Durango, Colo.	Silsby	1882
Eastern Michigan Asylum, Pontiac, Mich.	Silsby	1865
East Liverpool, Ohio.	Silsby	1890
Easton, Pa.	Silsby Clapp & Jones	1870
East Stoughton, Mass.	Silsby	1880
East Weymouth, Mass.	Button	1883
Eaton, Ohio.	Ahrens	1872
Eaton Rapids, Mich.	Silsby	1874
Eatontown, N. J.	Button	1864
Eau Claire, Wis.	Silsby	1871
Elgin, Ill.	Silsby	1869
Elizabeth, N. J.	Button	1868
Elizabeth City, N. C.	Silsby	1873
Elizabethtown, Pa.	Clapp & Jones	1879
Elkhart, Ind.	Silsby	1867
Elkland, Pa.	Silsby	1872
Ellensburgh, Wash.	Silsby	1889
El Paso, Tex.	Silsby	1892
Elyria, Ohio.	Silsby	1873
Emery, L., Jr., & Co., Bradford, Pa.	Silsby	1880
Ennis, Tex.	Silsby	1884
Erie, Pa.	Silsby	1867
Escanaba, Mich.	Clapp & Jones	1873
Estey Organ Co., Brattleboro, Vt.	Clapp & Jones	1876
Eufaula, Ala.	Silsby	1883
Eureka, Cal.	Silsby	1870
Evansville, Ind.	Ahrens Silsby Clapp & Jones	1866
Everett, Pa.	Silsby	1880
Fairbank, N. K., & Co., Chicago, Ill.	Silsby	1871
Fairhaven, Wash.	Silsby	1890
Fairport, N. Y.	Silsby	1878
Fall River, Mass.	Silsby Clapp & Jones	1873
Faribault, Minn.	Silsby	1876
Farmington, Me.	Silsby	1882
Fayetteville, N. C.	Silsby	1885
Fenton, Mich.	Silsby	1879
Fergus Falls, Minn.	Silsby	1882
Findlay, Ohio.	Silsby	1871
Fleischmann & Co., Cincinnati, Ohio.	Ahrens	1869
Flint, Mich.	Silsby	1866
Florence, S. C.	Silsby	1881
Fort Edward, N. Y.	Clapp & Jones	1874
Fort Howard, Wis.	Button	1872
Fort Leavenworth, Kans.	Silsby	1864
Fort Madison, Iowa.	Silsby	1873
Fort Wayne, Ind.	Silsby	1861
Fort Worth, Tex.	Silsby	1876
Fostoria, Ohio.	Silsby	1877
Fountain City, Wis.	Ahrens	1893
Framingham, Mass.	Silsby	1885
Frankfort, Ky.	Ahrens	1881
Frankfort, N. Y.	Silsby	1890
Franklin, Ohio.	Ahrens	1877
Frederick, Md.	Silsby	1876
Fredericton, N. B., Can.	Silsby	1874
Freehold, N. J.	Button	1887
Freeport, Ill.	Silsby	1867
Fremont, Ohio.	Clapp & Jones	1873
Frenchtown, N. J.	Clapp & Jones	1888
Fresno, Cal.	Ahrens Silsby	1883
Friendship, N. Y.	Silsby	1881
Fulton, N. Y.	Button	1866
Gainesville, Ga.	Silsby	1886
Galion, Ohio.	Ahrens	1873
Gallipolis, Ohio.	Ahrens Silsby	1871
Galveston, Tex.	Ahrens Silsby	1866
Gardiner, Me.	Silsby	1880
Geneseo, N. Y.	Silsby	1876
Geneva, N. Y.	Silsby Button	1864
Geneva, Ohio.	Clapp & Jones	1874
Germantown, Ohio.	Ahrens	1886
Gettysburg, Pa.	Silsby	1886
Gilberton, Pa.	Clapp & Jones	1892
Gladstone, Mich.	Button	1888
Glens Falls, N. Y.	Clapp & Jones	1891

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Gloucester, Mass.	Silsby	1884
Goderich, Ont., Can.	Silsby	1873
Goldsboro, N. C.	Silsby	1882
Gowanda, N. Y.	Silsby	1871
Grand Haven, Mich.	Clapp & Jones	1886
Grand Rapids, Mich.	Ahrens / Silsby / Button	1865
Grand Rapids, Wis.	Clapp & Jones	1873
Great Barrington, Mass.	Button	1882
Great Bend, Pa.	Button	1868
Greenbush, N. Y.	Clapp & Jones	1871
Greencastle, Ind.	Ahrens	1882
Greencastle, Pa.	Silsby	1870
Green Island, N. Y.	Button	1884
Greensburg, Ind.	Ahrens	1874
Greenville, Mich.	Clapp & Jones	1872
Greenville, Miss.	Silsby	1885
Greenville, Ohio.	Silsby	1871
Greenville, Pa.	Silsby	1880
Griffin, Ga.	Silsby	1870
Grinnell, Iowa.	Silsby	1885
Guelph, Ont., Can.	Silsby	1868
Hackensack, N. J.	Button	1893
Hagerstown, Md.	Silsby	1880
Hallstead, Pa.	Button	1868
Hamburg, Pa.	Silsby	1877
Hamilton, N. Y.	Button	1887
Hamilton, Ohio.	Ahrens / Silsby	1864
Hamilton, Ont., Can.	Clapp & Jones	1883
Hammond, Ind.	Silsby	1872
Hampshire, Ill.	Silsby	1870
Hanover, Pa.	Silsby	1882
Harlan, Iowa.	Silsby	1878
Harmar, Ohio.	Button	1875
Harmony Mills, Cohoes, N. Y.	Button	1867
Harrisburg, Pa.	Silsby / Button	1865
Harrison, N. J.	Clapp & Jones	1879
Harrison, Ohio.	Ahrens	1883
Hartford, Conn.	Silsby / Clapp & Jones	1880
Havana, Cuba.	Silsby / Clapp & Jones	1876
Haverstraw, N. Y.	Button	1876
Hawaiian Government.	Clapp & Jones	1878
Hazleton, Pa.	Silsby	1885
Helena, Ark.	Button	1875
Helena, Mont.	Silsby	1874
Hempstead, N. Y.	Silsby	1882
Herkimer, N. Y.	Button	1875
Hightstown, N. J.	Button	1887
Hillsboro, Tex.	Silsby	1883
Hillsboro, Ohio.	Ahrens	1875
Hoboken, N. J.	Clapp & Jones	1889
Holgate, Ohio.	Clapp & Jones	1889
Hollidaysburg, Pa.	Button	1871
Holliston, Mass.	Silsby	1871
Holyoke, Mass.	Button	1885
Homer, N. Y.	Silsby	1873
Honeoye Falls, N. Y.	Silsby	1884
Honesdale, Pa.	Silsby	1875
Honolulu, Hawaii.	Clapp & Jones	1891
Hoosick Falls, N. Y.	Button	1871
Hopkinsville, Ky.	Silsby	1869
Hoquiam, Wash.	Clapp & Jones	1890
Horicon, Wis.	Silsby	1885
Hornellsville, N. Y.	Silsby	1874
Horseheads, N. Y.	Silsby	1873
Hot Springs, Ark.	Ahrens / Silsby	1876
Houma, La.	Silsby	1887
Hudson, Wis.	Silsby	1872
Huntingdon, Pa.	Silsby	1872
Huntington, Ind.	Clapp & Jones	1874
Huntington, W. Va.	Ahrens	1882
Huntsville, Ala.	Silsby	1866
Hurley, Wis.	Clapp & Jones	1886
Ilion, N. Y.	Silsby	1865
Independence, Iowa.	Clapp & Jones	1874
Indianapolis, Ind.	Ahrens / Clapp & Jones	1874
Ingersoll, Ont., Can.	Silsby	1873
Iron Mountain, Mich.	Clapp & Jones	1884
Ishpeming, Mich.	Silsby	1874
Ithaca, N. Y.	Silsby / Clapp & Jones	1871
Jackson, Mich.	Silsby	1865
Jackson, Miss.	Silsby / Button	1868
Jackson, Ohio.	Silsby	1874
Jacksonville, Ill.	Silsby	1887
Janesville, Wis.	Button	1868
Jeanerette, La.	Silsby	1885
Jefferson, Tex.	Silsby / Button	1870
Jefferson, Wis.	Silsby	1871
Jefferson City, Mo.	Silsby	1870
Jefferson City, Mo., State Penitentiary.	Ahrens	1884
Jersey City, N. J.	Clapp & Jones	1873
Johnstown, Pa.	Silsby / Button	1889
Joliet, Ill.	Silsby	1869
Jonesville, Mich.	Silsby	1886
Jordan, N. Y.	Button	1869

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Kansas City, Mo.	Ahrens Silsby Clapp & Jones	1868
Kaukauna, Wis.	Button	1885
Keene, N. H.	Button	1890
Kemptville, Ont., Can.	Silsby	1881
Kenosha, Wis.	Silsby Clapp & Jones	1875
Keokuk, Iowa.	Silsby	1870
Key West, Fla.	Silsby Button	1886
Kinderhook, N. Y.	Clapp & Jones	1882
Kingston, N. Y.	Clapp & Jones Button	1867
Kingston, Pa.	Clapp & Jones	1889
Knoxville, Tenn.	Silsby	1867
Kokomo, Ind.	Clapp & Jones	1872
La Crosse, Wis.	Silsby	1866
La Fayette, Ind.	Silsby	1864
Lake Charles, La.	Silsby	1885
Lake City, Minn.	Silsby	1875
Lake Providence, La.	Ahrens	1879
Lambertville, N. J.	Button	1869
Lanark, Ont., Can.	Silsby	1866
Lancaster, Ohio.	Silsby	1869
Lancaster, Pa.	Clapp & Jones Button	1865
L'Anse, Mich.	Clapp & Jones	1873
Lansing, Kansas, State Penitentiary.	Button	1879
Lansing, Mich.	Silsby Clapp & Jones	1872
Lansingburg, N. Y.	Button	1864
Lapeer, Mich.	Silsby	1878
Laprairie, Que., Can.	Clapp & Jones	1877
Laramie, Wyo.	Silsby	1882
Laredo, Tex.	Silsby	1890
La Salle, Ill.	Silsby	1873
Laurens, S. C.	Silsby	1887
Lawrenceburg, Ind.	Ahrens	1883
Leavenworth, Kan.	Ahrens Silsby	1866
Lebanon, Pa.	Clapp & Jones Button	1868
Leesburg, Fla.	Silsby	1886
Leicester, Mass.	Button	1869
Le Mars, Iowa.	Silsby	1882
Lena, Ill.	Ahrens	1881
Levis, Que., Can.	Clapp & Jones	1877
Lewisburg, Pa.	Silsby	1874
Lewistown, Pa.	Silsby	1877
Lexington, Ky.	Silsby	1864
Lima, Ohio.	Silsby Clapp & Jones	1872
Lincoln, Nebr.	Silsby	1872
Linesville, Pa.	Silsby	1891
Little Falls, N. Y.	Button	1870
Little Rock, Ark.	Silsby Button	1872
Lock Haven, Pa.	Silsby Button	1873
Logansport, Ind.	Silsby Clapp & Jones	1870
London, Ohio.	Silsby	1871
Long Branch, N. J.	Clapp & Jones	1886
Long Island City, N. Y.	Clapp & Jones	1888
Longview, Tex.	Silsby	1872
Los Angeles, Cal.	Ahrens	1887
Louisiana, Mo.	Silsby	1870
Louisville, Ky.	Ahrens	1871
Lowell, Mass.	Clapp & Jones	1892
Ludlow, Vt.	Silsby	1883
Lynchburg, Va.	Silsby Clapp & Jones	1877
Lynn, Mass.	Button	1890
Lyons, N. Y.	Silsby Button	1870
McKinney, Tex.	Silsby	1887
Mackinac, Mich.	Button	1887
Macon, Ga.	Silsby Clapp & Jones	1867
Macon City, Mo.	Silsby	1871
Madison, Ind.	Ahrens	1870
Mahanoy City, Pa.	Silsby	1872
Malden, Mass.	Silsby	1880
Malone, N. Y.	Silsby	1880
Manchester, Ind.	Clapp & Jones	1888
Manchester, Iowa.	Silsby	1875
Manistee, Mich.	Clapp & Jones	1872
Mansfield, Ohio.	Silsby	1866
Mansfield, G. C., Johnson's Creek, Wis.	Silsby	1871
Marathon, N. Y.	Clapp & Jones	1889
Marblehead, Mass.	Silsby	1880
Marietta, Ga.	Silsby	1881
Marietta, Ohio.	Silsby	1870
Marietta, Pa.	Silsby	1872
Marine City, Mich.	Silsby	1874
Marinette, Wis.	Clapp & Jones	1884
Marion, Ohio.	Silsby	1872
Marshall, Ill.	Button	1880
Marshall, Minn.	Clapp & Jones	1890
Marshall, Tex.	Silsby	1885
Martinsburg, W. Va.	Silsby	1870
Marysville, Cal.	Silsby Clapp & Jones	1862
Marysville, Ohio.	Ahrens	1879
Mason, Mich.	Silsby	1885

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Maspeth, N. Y.	Silsby	1873
Massillon, Ohio.	Clapp & Jones	1874
Matanzas, Cuba.	Silsby	1885
Mauch Chunk, Pa.	Silsby	1875
Meadville, Pa.	Silsby	1866
Mechanicsburg, Pa.	Silsby	1870
Mechanicsville, N. Y.	Button	1871
Medina, Ohio.	Silsby	1877
Memphis, Tenn.	Ahrens / Silsby	1866
Menasha, Wis.	Silsby	1886
Merced, Cal.	Silsby	1883
Merchants' Cotton Press and Storage Co., Memphis, Tenn.	Ahrens	1874
Mercersburg, Pa.	Silsby	1873
Merida, Mexico.	Silsby	1890
Meriden, Conn.	Silsby	1884
Meridian, Miss.	Silsby	1882
Mexico, N. Y.	Silsby	1887
Miamisburg, Ohio.	Ahrens	1886
Michigan City, Ind.	Button	1883
Middleburg, N. Y.	Clapp & Jones	1887
Middlesborough, Ky.	Silsby	1871
Midway, Ky.	Ahrens	1876
Millbury, Mass.	Silsby	1871
Mill Creek Distilling Co., Cincinnati, Ohio.	Ahrens	1875
Milton, Pa.	Silsby	1876
Milwaukee, Wis.	Ahrens	1879
Minneapolis, Minn.	Ahrens / Clapp & Jones	1883
Moberly, Mo.	Silsby	1873
Mobile, Ala.	Silsby / Clapp & Jones	1866
Mohawk, N. Y.	Button	1875
Monmouth, Ill.	Silsby	1868
Monroe, La.	Silsby	1873
Monroe, Mich.	Silsby / Clapp & Jones	1875
Monroe, S. C.	Silsby	1886
Monroeville, Ohio.	Clapp & Jones	1878
Montague, Mich.	Clapp & Jones	1873
Montezuma, Ga.	Button	1883
Montgomery, Ala.	Ahrens / Silsby	1871
Montgomery, Pa.	Silsby	1873
Montreal, Que., Can.	Silsby / Clapp & Jones	1877
Morgan City, La.	Silsby	1890
Morristown, N. J.	Clapp & Jones	1873
Morrow, Ohio.	Ahrens	1889
Mount Clemens, Mich.	Silsby	1884
Mount Holly, N. J.	Silsby	1880
Mount Sterling, Ky.	Ahrens / Button	1878
Muncie, Ind.	Clapp & Jones	1874
Muncy, Pa.	Silsby	1874
Muskegon, Mich.	Silsby	1868
Myerstown, Pa.	Silsby	1883
Naperville, Ill.	Silsby	1887
Napoleon, Ohio.	Clapp & Jones	1872
Nashville, Tenn.	Ahrens	1874
Nassau, N. P., Bahamas.	Button	1889
Natchez, Miss.	Silsby / Button	1870
Natchitoches, La.	Silsby	1891
Natick, Mass.	Clapp & Jones	1890
National Watch Co., Elgin, Ill.	Silsby	1872
Nebraska City, Neb.	Silsby / Button	1884
Neenah, Wis.	Silsby	1869
Negaunee, Mich.	Silsby	1873
Negociacion Minera de Maravellas, City of Mexico.	Silsby	1878
New Albany, Ind.	Silsby	1863
Newark, N. J.	Button	1889
Newark, Ohio.	Ahrens / Silsby	1866
New Bedford, Mass.	Silsby / Clapp & Jones	1873
New Berne, N. C.	Silsby / Button	1879
New Brunswick, N. J.	Silsby / Clapp & Jones / Button	1867
Newburgh, N. Y.	Clapp & Jones	1892
New Castle, Del.	Silsby	1887
New Castle, Pa.	Button	1873
New Haven, Conn.	Silsby	1883
New Iberia, La.	Silsby	1883
New Orleans, La.	Ahrens / Silsby	1878
New Philadelphia, Ohio.	Silsby	1867
Newport, N. H.	Silsby	1885
Newport, R. I.	Clapp & Jones	1872
New Rochelle, N. Y.	Silsby / Button	1885
Newton, N. J.	Clapp & Jones	1873
Newtown, N. Y.	Button	1890
New York, N. Y.	Ahrens / Silsby / Clapp & Jones	1860
New York Fire Insurance Patrol, New York, N. Y.	Silsby	1881

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Norfolk, Va.	Silsby Clapp & Jones	1892
Norristown, Pa.	Silsby Button	1881
North Amherst, Ohio.	Ahrens	1888
Northampton, Mass.	Silsby Clapp & Jones	1870
North Manchester, Ind.	Clapp & Jones	1885
North Tonawanda, N. Y.	Clapp & Jones	1881
North Vernon, Ind.	Ahrens	1886
Norway, Mich.	Silsby	1882
Norwich, N. Y.	Clapp & Jones	1872
Nyack, N. Y.	Silsby Clapp & Jones Button	1883
Oakland, Cal.	Ahrens Silsby Clapp & Jones	1872
Oberlin, Ohio.	Silsby	1866
Ocean Grove, N. J.	Clapp & Jones	1886
Oconomowoc, Wis.	Silsby	1879
Oconto, Wis.	Silsby	1872
Ogdensburg, N. Y.	Clapp & Jones	1887
Oil City, Pa.	Button	1870
Old Orchard, Me.	Silsby	1883
Old Town, Me.	Button	1885
Olean, N. Y.	Silsby	1881
Olympia, Wash.	Silsby	1883
Omaha, Nebr.	Ahrens Silsby	1866
Omro, Wis.	Clapp & Jones	1891
Oneonta, N. Y.	Button	1875
Ontonagon, Mich.	Clapp & Jones	1874
Opelika, Ala.	Silsby	1878
Opelousas, La.	Silsby	1882
Orange, Mass.	Silsby	1883
Orangeburg, S. C.	Silsby	1880
Orrville, Ohio.	Button	1888
Osage, Iowa.	Button	1882
Osborne, D. M., & Co., Auburn, N. Y.	Silsby	1889
Oshkosh, Wis.	Ahrens Silsby	1866
Oswego, N. Y.	Silsby Button	1865
Ottawa, Ill.	Silsby	1873
Ottawa, Kans.	Ahrens	1883
Ottawa, Ohio.	Silsby	1883
Ottumwa, Iowa.	Silsby	1867
Owensboro, Ky.	Ahrens	1873
Owosso, Mich.	Silsby	1878
Oxford, Mass.	Silsby	1884
Oxford, N. Y.	Silsby	1888
Oxford, Ohio.	Ahrens	1875
Oxford, Pa.	Silsby	1880
Paducah, Ky.	Ahrens Silsby	1869
Painesville, Ohio.	Silsby	1871
Palatka, Fla.	Silsby	1882
Palmer. Mass.	Clapp & Jones	1885
Palmyra, N. Y.	Silsby	1868
Paris, Ky.	Ahrens	1878
Paris, Tex.	Silsby	1877
Parkersburg, W. Va.	Ahrens	1878
Pasadena, Cal.	Silsby	1889
Passaic, N. J.	Clapp & Jones	1886
Paterson, N. J.	Silsby Clapp & Jones Button	1884
Patterson, Pa.	Button	1876
Paw Paw, Mich.	Silsby	1880
Peabody, Mass.	Button	1874
Pekin, Ill.	Ahrens	1884
Pendleton, Oreg.	Ahrens	1885
Penn Yan, N. Y.	Silsby	1872
Pensacola, Fla.	Ahrens Silsby	1879
Pentwater, Mich.	Clapp & Jones	1872
Peoria, Ill.	Ahrens Clapp & Jones Button	1883
Peru, Ill.	Silsby	1874
Peterborough, Ont., Can.	Silsby	1871
Philadelphia, Pa.	Silsby	1886
Phillipsburg, N. J.	Silsby	1878
Phœnix, Ariz.	Ahrens	1887
Pictou, N. S., Can.	Silsby	1878
Piermont, N. Y.	Button	1891
Pigeon Cove, Mass.	Silsby	1888
Pine Bluff, Ark.	Silsby	1877
Piqua, Ohio.	Ahrens	1892
Pittsfield, Mass.	Silsby Clapp & Jones	1885
Pittston, Pa.	Silsby Button	1876
Plymouth, Mass.	Button	1874
Pocomoke City, Md.	Clapp & Jones	1888
Pomeroy, Ohio.	Silsby	1868
Pontiac, Ill.	Silsby	1873
Pontiac, Mich.	Silsby	1865
Portage La Prairie, Man., Can.	Clapp & Jones	1877
Port Clinton, Ohio.	Silsby	1871
Port Chester, N. Y.	Clapp & Jones	1892
Port Deposit, Md.	Clapp & Jones	1885
Port Henry, N. Y.	Clapp & Jones	1875
Port Huron, Mich.	Clapp & Jones	1888
Portland, Ind.	Ahrens	1887

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Portland, Me.	Silsby Clapp & Jones	1883
Portland, Oreg.	Silsby Clapp & Jones	1865
Port Richmond, N. Y.	Button	1884
Portsmouth, Ohio.	Ahrens Silsby	1867
Port Townsend, Wash.	Silsby	1889
Potsdam, N. Y.	Button	1888
Pottstown, Pa.	Silsby Button	1871
Pottstown Iron Co., Pottstown, Pa.	Button	1876
Pottsville, Pa.	Silsby	1875
Poughkeepsie, N. Y.	Silsby Clapp & Jones	1860
Providence, R. I.	Silsby	1860
Pueblo, Colo.	Ahrens	1889
Quebec, Que., Can.	Clapp & Jones	1876
Quincy, Ill.	Ahrens Silsby	1866
Quitman, Ga.	Button	1884
Racine, Wis.	Ahrens Silsby Clapp & Jones	1866
Rathbun Co., The, Deseronto, Ont., Can.	Silsby	1875
Ravenna, Ohio.	Silsby	1870
Reading, Mass.	Button	1883
Reading, Pa.	Ahrens Silsby Clapp & Jones	1875
Red Bluff, Cal.	Silsby	1880
Red Jacket, Mich.	Clapp & Jones	1875
Red Wing, Minn.	Silsby	1871
Refuge Oil Mill, Vicksburg, Miss.	Silsby	1872
Reidsville, N. C.	Silsby	1884
Reno, Nev.	Clapp & Jones	1874
Republic, Mich.	Silsby	1868
Rhinebeck, N. Y.	Button	1871
Richland Center, Wis.	Silsby	1887
Richmond, Ind.	Silsby	1860
Richmond, Va.	Silsby Clapp & Jones Button	1881
Richwood, Ohio.	Silsby	1875
Ripley, Ohio.	Ahrens	1887
Rochester, N. Y.	Silsby Clapp & Jones	1861
Rockaway Beach, N. Y.	Clapp & Jones	1889
Rockford, Ill.	Ahrens Clapp & Jones	1883
Rock Hill, S. C.	Silsby	1887
Rockland Lake, N. Y.	Clapp & Jones	1889
Rockport, Mass.	Silsby	1885
Rockville, Conn.	Silsby	1882
Rome, Ga.	Silsby	1867
Rome, N. Y.	Silsby	1881
Romeo, Mich.	Clapp & Jones	1872
Royer's Ford, Pa.	Button	1885
Rushville, Ind.	Ahrens	1881
Sacket's Harbor, N. Y.	Clapp & Jones	1889
Saginaw, Mich.	Silsby	1865
Sagua la Grande, Cuba.	Silsby	1884
Saint Augustine, Fla.	Silsby	1887
Saint Bernard, La.	Ahrens	1883
Saint Clair, Mich.	Silsby	1874
Saint Hyacinthe, Que., Can.	Silsby	1887
Saint Ignace, Mich.	Silsby	1872
Saint John's, Mich.	Silsby	1880
Saint John's, Que., Can.	Silsby	1876
Saint Joseph, Mich.	Silsby	1873
Saint Louis, Mo.	Ahrens	1865
Saint Martinville, La.	Silsby	1889
Saint Paris, Ohio.	Ahrens	1885
Saint Paul, Minn.	Ahrens Silsby Clapp & Jones	1866
Salamanca, N. Y.	Silsby	1880
Salem, Ind.	Silsby	1878
Salem, N. J.	Silsby	1878
Salem, N. Y.	Clapp & Jones	1875
Salem, N. C.	Button	1886
Salem, Ohio.	Silsby Clapp & Jones	1869
Salem, Oreg.	Silsby	1882
Salisbury, Md.	Silsby	1879
Salt Lake City, Utah.	Silsby	1872
San Antonio, Tex.	Ahrens	1886
San Diego, Cal.	Ahrens	1888
Sandusky, Ohio.	Silsby	1865
Sandy Hill, N. Y.	Button	1881
San Francisco, Cal.	Clapp & Jones Button	1864
San Jose, Cal.	Silsby Clapp & Jones	1866
San Luis Obispo, Cal.	Silsby	1890
Santa Clara, Cuba.	Silsby	1882
Santiago de Cuba, Cuba.	Silsby	1882
Saratoga Springs, N. Y.	Silsby Button	1866
Saugerties, N. Y.	Clapp & Jones	1873
Saxonville, Mass.	Silsby	1886
Schenectady, N. Y.	Clapp & Jones Button	1869
Schuylerville, N. Y.	Silsby	1881

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Scranton, Pa.	Silsby, Clapp & Jones, Button	1868
Seabright, N. J.	Button	1883
Seattle, Wash.	Ahrens	1889
Sedalia, Mo.	Silsby	1868
Selin's Grove, Pa.	Silsby	1872
Selma, Ala.	Silsby	1869
Seneca Falls, N. Y.	Silsby	1860
Seney, Mich.	Button	1876
Seymour, Conn.	Button	1884
Seymour, Ind.	Ahrens	1885
Shamokin, Pa.	Silsby	1881
Shanghai, China.	Silsby	1874
Sharon, Pa.	Silsby	1873
Sheboygan, Wis.	Ahrens, Silsby	1873
Shelburne Falls, Mass.	Silsby	1888
Shelby, Mich.	Button	1886
Shelbyville, Ind.	Ahrens	1875
Shenandoah, Pa.	Button	1878
Shepherdstown, W. Va.	Silsby	1885
Sherbrooke, Que., Can.	Silsby	1875
Sherman, Tex.	Silsby	1873
Shreveport, La.	Silsby, Clapp & Jones	1866
Sidney, Ohio.	Ahrens	1883
Silver Creek, N. Y.	Silsby	1874
Sing Sing, N. Y.	Silsby	1876
Sioux City, Iowa.	Silsby	1874
Sioux Falls, S. Dak.	Silsby	1882
Sisson & Lilley, Spring Lake, Mich.	Silsby	1867
Slatington, Pa.	Silsby	1891
Smith Paper Co., Lee, Mass.	Clapp & Jones	1879
Smith's Falls, Ont., Can.	Silsby	1875
Somerville, Mass.	Silsby	1883
Sorel, Que., Can.	Silsby	1884
South Amboy, N. J.	Silsby	1891
South Ashburnham, Mass.	Silsby	1891
South Gardiner, Me.	Silsby	1882
Sparta, Wis.	Silsby	1870
Spokane, Wash.	Silsby	1889
Sprague, A. & W., Mfg. Co., Providence, R. I.	Silsby	1872
Spring City, Pa.	Silsby	1882
Springfield, Ill.	Ahrens, Silsby, Button	1869
Springfield, Ohio.	Silsby	1864
Springfield, Vt.	Silsby	1882
Spring Lake, Mich.	Clapp & Jones	1885
Spring Lake, N. J.	Silsby	1891
Springport, Mich.	Button	1863
Stamford, Conn.	Button	1883
Stapleton, N. Y.	Silsby	1871
Steelton, Pa.	Button	1886
Steubenville, Ohio.	Button	1870
Stillwater, Minn.	Silsby	1872
Stillwater, N. Y.	Button	1886
Stoughton, Mass.	Silsby	1880
Stratford, Ont., Can.	Silsby	1875
Stroudsburg, Pa.	Clapp & Jones	1872
Stuart, Iowa.	Silsby	1875
Studebaker Bros. Mfg. Co., South Bend, Ind.	Silsby	1867
Sullivan, Ind.	Ahrens	1886
Sunbury, Pa.	Silsby	1870
Superior, Wis.	Ahrens	1891
Swampscott, Mass.	Silsby	1883
Sydney, N. S. W., Australia.	Button	1885
Syracuse, N. Y.	Silsby, Clapp & Jones	1885
Tacoma, Wash.	Ahrens, Silsby, Clapp & Jones	1889
Tamarack Mining Co., Opeechee, Mich.	Silsby	1863
Thibodeaux, La.	Silsby	1888
Thomaston Me., State Prison.	Button	1873
Thomasville, Ga.	Silsby	1883
Thomson, Ga.	Clapp & Jones	1888
Tiffin, Ohio.	Silsby	1867
Tippecanoe City, Ohio.	Silsby	1874
Titusville, Pa.	Clapp & Jones	1872
Tivoli, N. Y.	Clapp & Jones	1887
Toledo, Ohio.	Ahrens, Silsby, Clapp & Jones	1861
Tompkinsville, N. Y.	Button	1880
Tonawanda, N. Y.	Silsby	1871
Topeka, Kans.	Ahrens, Silsby	1870
Toronto, Ont., Can.	Silsby	1861
Torrington, Conn.	Silsby	1888
Towanda, Pa.	Silsby	1870
Tower, Minn.	Ahrens, Silsby	1862
Town of Union, N. J.	Silsby	1883
Traer, Iowa.	Silsby	1865
Tremont, Pa.	Silsby	1878
Trenton, N. J.	Silsby, Clapp & Jones, Button	1864

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Troy, Ala.	Silsby	1871
Troy, N. Y.	Clapp & Jones / Button	1864
Troy, Ohio.	Silsby	1870
Troy, Pa.	Clapp & Jones	1872
Tyrone, Pa.	Silsby	1873
Union City, Mich.	Button	1887
Union Pacific R. R. Shops, Omaha, Nebr.	Silsby	1870
Union Springs, N. Y.	Silsby	1879
Union Stock Yards and Transit Co., Chicago, Ill.	Silsby	1871
Uniontown, Pa.	Ahrens	1877
U. S. Government.	Ahrens / Silsby / Clapp & Jones / Button	
Augusta, Ga.		1867
Baton Rouge, La.		1867
Charleston, S. C.		1866
Cheyenne, Wyo.		1868
Leavenworth, Kans.		1867
Pittsburgh, Pa.		1864
St. Louis, Mo.		1865
Watervliet, N. Y.		1864
Upper Sandusky, Ohio.	Silsby	1867
Urbana, Ohio.	Silsby	1868
Utica, N. Y.	Silsby / Clapp & Jones	1864
Valdosta, Ga.	Silsby	1884
Vallejo, Cal.	Clapp & Jones	1878
Valleyfield, Que., Can.	Clapp & Jones	1878
Valparaiso, Chili.	Clapp & Jones	1874
Vancouver, Wash.	Silsby	1884
Van Wert, Ohio.	Ahrens	1877
Vera Cruz, Mexico.	Clapp & Jones	1880
Versailles, Ky.	Ahrens	1888
Victoria, B. C., Can.	Button	1868
Vicksburg, Miss.	Ahrens	1882
Vinal Haven, Me.	Silsby	1888
Vincennes, Ind.	Ahrens	1880
Vinton, Iowa.	Silsby	1881
Virginia City, Nev.	Clapp & Jones / Button	1873
Visalia, Cal.	Silsby	1888
Wabasha, Minn.	Silsby	1888
Waco, Tex.	Silsby	1873
Wakefield, Mass.	Silsby	1882
Walden, N. Y.	Button	1872
Wallaceburg, Ont., Can.	Clapp & Jones	1885
Walsh, N. J., Lawrenceburg, Ind.	Ahrens	1883
Walla Walla, Wash.	Silsby	1871
Wallingford, Conn.	Button	1880
Wapakoneta, Ohio.	Clapp & Jones	1873
Wappinger's Falls, N. Y.	Button	1869
Ware, Mass.	Silsby	1885
Warren, Ohio.	Silsby	1868
Warren, Pa.	Silsby	1873
Warsaw, Ind.	Silsby	1868
Washington, D. C.	Silsby / Clapp & Jones	1870
Washington, Ind.	Ahrens	1878
Washington, N. C.	Silsby	1887
Washington, Pa.	Silsby	1872
Washington C. H., Ohio.	Clapp & Jones	1875
Wassau, Wis.	Ahrens	1880
Waterbury, Conn.	Silsby	1880
Waterford, N. Y.	Button	1864
Waterloo, Iowa.	Button	1881
Waterloo, N. Y.	Silsby	1864
Waterloo, Wis.	Silsby	1874
Watertown, N. Y.	Silsby	1875
Watertown, Wis.	Ahrens / Silsby	1876
Waterville, Me.	Button	1884
Watsontown, Pa.	Silsby	1874
Waukegan, Ill.	Silsby	1874
Waukesha, Wis.	Ahrens	1882
Waverly, N. Y.	Silsby	1873
Waverly, Ohio.	Ahrens	1875
Waxahachie, Tex.	Silsby	1883
Waynesboro, Pa.	Silsby	1880
Waynesville, Ohio.	Ahrens	1886
Weatherford, Tex.	Silsby	1884
Weatherly, Pa.	Silsby	1893
Weedsport, N. Y.	Silsby	1879
Weimar, Tex.	Silsby	1876
Wellsville, N. Y.	Silsby	1872
West Bay City, Mich.	Clapp & Jones	1872
West Brookfield, Mass.	Silsby	1888
West Chester, Pa.	Silsby / Button	1876
Westfield, Mass.	Silsby	1871
West Liberty, Ohio.	Button	1890
West New Brighton, N. Y.	Clapp & Jones	1872
West Newbury, Mass.	Button	1884
West Point, Ga.	Silsby	1885
West Troy, N. Y.	Button	1864
Westwood, Ohio.	Ahrens	1891
Weymouth, Mass.	Button	1880
Wheeling, W. Va.	Ahrens / Silsby	1884
Whitehall, Mich.	Silsby	1874
Whitehall, N. Y.	Button	1869

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White Haven, Pa.	Silsby	1877
Whitesboro, N. Y.	Silsby	1865
Wichita, Kans.	Ahrens	1890
Wilkesbarre, Pa.	Ahrens, Button	1886
Willard, N. Y., State Hospital.	Silsby	1872
Williamsport, Pa.	Clapp & Jones	1872
Williamston, Mich.	Clapp & Jones	1887
Wilmington, Del.	Silsby, Clapp & Jones	1872
Wilmington, N. C.	Silsby, Button	1869
Wilmington, Ohio.	Ahrens, Clapp & Jones	1875
Wilson, N. C.	Silsby	1887
Winchendon, Mass.	Silsby	1891
Winchester, Ky.	Silsby	1886
Winchester, Va.	Silsby	1871
Winnipeg, Man., Can.	Silsby	1874
Winona, Minn.	Silsby	1870
Winsted, Conn.	Silsby	1884
Winterset, Iowa.	Silsby	1881
Woodland, Cal.	Clapp & Jones	1876
Wooster, Ohio.	Silsby	1868
Worcester, Mass.	Silsby, Clapp & Jones, Button	1860
Wyandotte, Mich.	Button	1876
Yantic, Conn.	Silsby	1891
Yarmouth, N. S., Can.	Silsby	1880
York, Pa.	Silsby, Button	1870
Youngstown, Ohio.	Silsby	1868
Ypsilanti, Mich.	Clapp & Jones	1873

The above list does not include any of the large number of users of our stationary steam fire engines.

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HOSE CARRIAGES, CARTS, AND WAGONS.

GENERAL DESCRIPTION.

Our vehicles for conveying hose are not surpassed, either in design, style, workmanship, or finish, by any others in the market. They are constructed throughout of the very best materials and by skilled workmen ; and those calculated for fire duty are built with a special view to great durability and ease and convenience in handling the hose.

The various styles described by us are those most commonly in use, and each one may be taken as the *standard* of its particular design.

We give no illustrations of carriages intended exclusively for parade purposes, for the reason that hardly any two such carriages are wanted alike. Those contemplating the purchase of parade carriages are requested to send for photographs and specifications, when we will take pleasure in supplying them with full particulars concerning numerous and different styles, with varying degrees of finish.

It is our aim to build all our apparatus as light as possible—without sacrificing the very essential requisites of strength and durability—and the weight can be varied to suit the requirements of different localities. Carriages built for use in the larger cities, for instance, require extra heavy running gear, which is, in fact, the principal reason for any variation in weight. It is advisable, however, to leave the matter of weight to our experience, as when knowing the condition of the streets or pavements in the town where apparatus is to be used, and the service it will be required to perform, we can be depended upon to build it of suitable weight, and, as said before, as light as possible consistent with proper strength and durability.

The capacities given are for 2½-inch rubber fire hose. A reel which will hold 750 feet of *rubber* hose will easily carry 1,000 feet of the heaviest or 1,500 feet of ordinary rubber-lined *cotton* hose, and over 2,000 feet of rubber lined or 3,000 feet unlined *linen* hose, supposing all to be of regulation fire department size, or with an internal diameter of 2½ inches.

Our designs cover every style of apparatus now in general use for carrying hose, and are adapted for large or small towns, as well as for paid or volunteer fire departments. But special apparatus will be built when desired, or we will vary the details of construction and finish of our regular styles to suit purchasers.

Every piece of apparatus is guaranteed to be as represented, and if not found to be so it may be returned at our expense.

Photographs of any particular style of carriage will be sent on application.

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HORSE HOSE CARRIAGE.

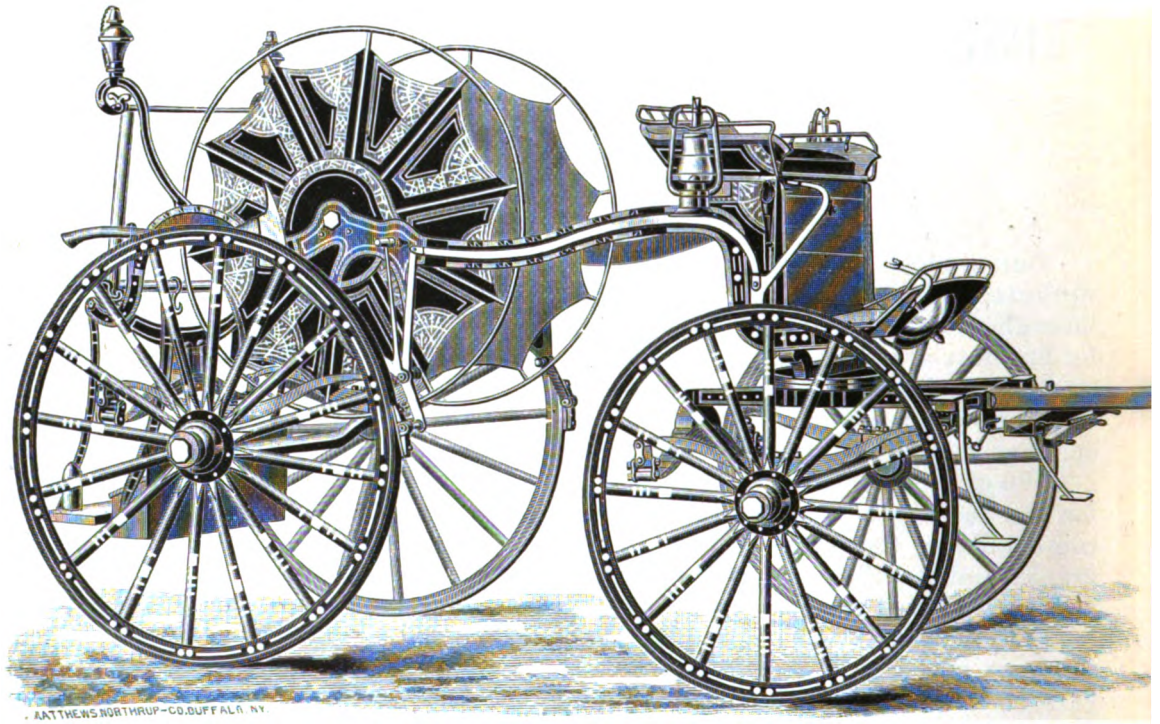

FIG. 50.

This carriage is hung on platform springs, of the best oil-tempered Swedes steel. The frame is either Burden iron or mild steel, and the axles are also steel. The wheels are of selected timber, of the latest improved kind, with steel tires. The reel is worked by means of right and left-hand cranks and gears, and is supplied with a friction brake operated from the driver's seat. There is a platform in the rear covered with corrugated rubber and having a leather-bound hand-rail, and six men can ride on the carriage.

The carriage is furnished complete with a brake for rear wheels, two hand lanterns, two torches, holders for two play pipes, gong, axe, crow-bar, cushion, whip socket, two tool boxes, and three wrenches. It is handsomely painted, with gold striping and ornamentation, and the trimmings and fixtures are finely finished and heavily nickel plated.

Size and Style.	Capacity, Rubber Hose.	Weight.	How Drawn.	Length.	Width.	Height.	Price.
No. 5	1,200 feet	2,250 lbs.	2 horses	21 ft. 8 in.	6 ft. 7 in.	7 ft. 8 in.	$950
No. 6	1,000 feet	2,100 lbs.	2 horses	21 ft. 6 in.	6 ft. 4 in.	7 ft. 8 in.	850
No. 7	850 feet	1,800 lbs.	2 horses	18 ft. 1 in.	5 ft. 10 in.	7 ft. 8 in.	850
No. 8	750 feet	1,400 lbs.	1 horse	17 ft. 11 in.	5 ft. 9 in.	7 ft. 1 in.	800

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HORSE HOSE WAGON.

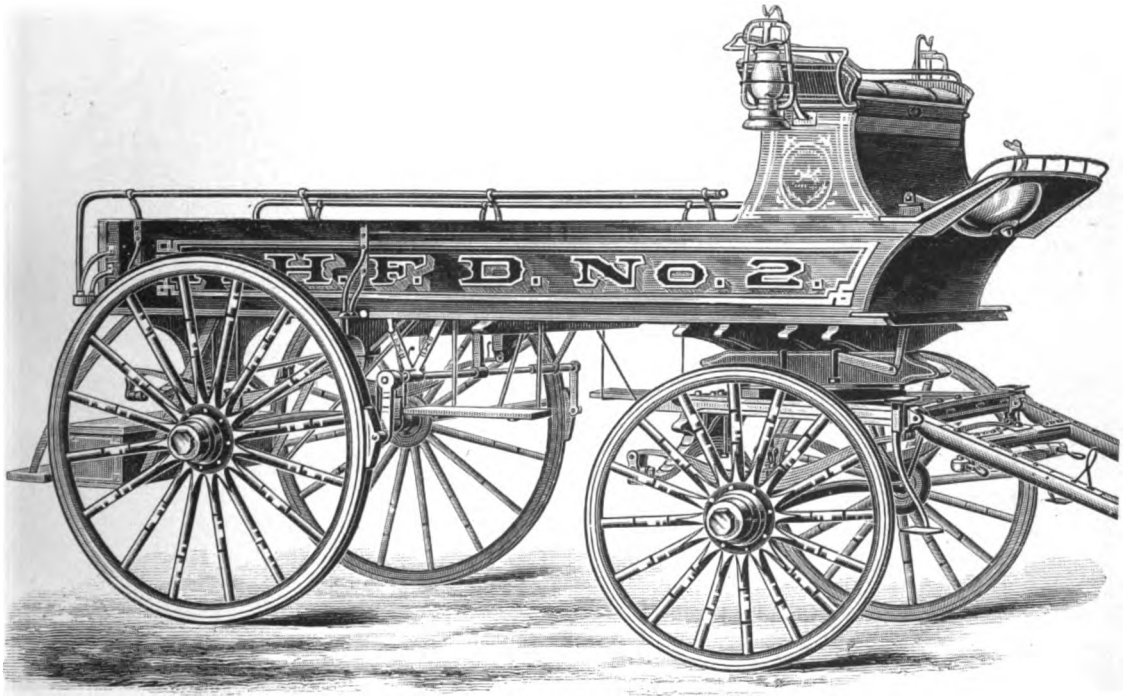

FIG. 70.

This wagon is hung on platform springs, made from Swedes steel, oil tempered. It has steel axles and the latest improved wheels, with steel tires. There is a brake for the rear wheels and a gong, both operated by the driver's foot. A pair of hand lanterns are attached, one on either side of the seat. The wagon is supplied with nickel-plated rails, axe, rubber matting on steps, blanket box, tool box, cushion, whip socket, and wrenches, besides side and bottom hose rollers in the rear.

It is elegantly painted and finely finished throughout, the trimmings and fixtures being polished and nickel plated.

Capacity, 750 feet rubber fire hose. Weight, 1,400 pounds. Dimensions: Length, 19 feet 3 inches; width, 5 feet 9 inches; height, 7 feet 2 inches. Price, $700.

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HORSE HOSE CART.

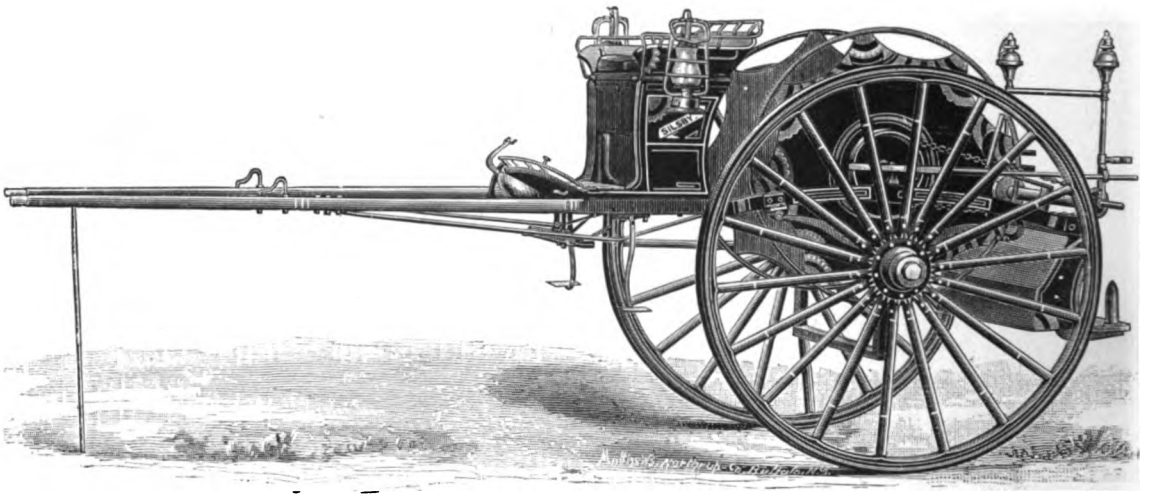

FIG. 80.

This cart has a crank axle, made of the best iron or mild steel, and is properly balanced. The wheels are of selected timber, with steel tires.

The reel is worked by means of right and left hand cranks and chains, and is supplied with a friction brake operated by the driver. The cart is furnished complete with a platform in the rear for firemen to ride on, with rubber matting and leather-covered hand-rail (six men can ride on the cart), two hand lanterns, two torches, holders for two play pipes, gong, axe, crow-bar, cushion, whip socket, two boxes for tools or blankets, and three wrenches. It is handsomely painted, with gold striping and ornamental scroll work, and the trimmings and fixtures are finished and nickel plated.

Size.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	1,000 feet	1,500 lbs.	14 ft. 6 in.	6 ft. 6 in.	6 ft. 4 in.	$600
No. 2	750 feet	1,000 lbs.	14 ft.	5 ft. 8 in.	5 ft. 10 in.	575
No. 3	600 feet	900 lbs.	14 ft.	5 ft. 8 in.	5 ft. 10 in.	550

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HORSE AND HAND CARRIAGE.

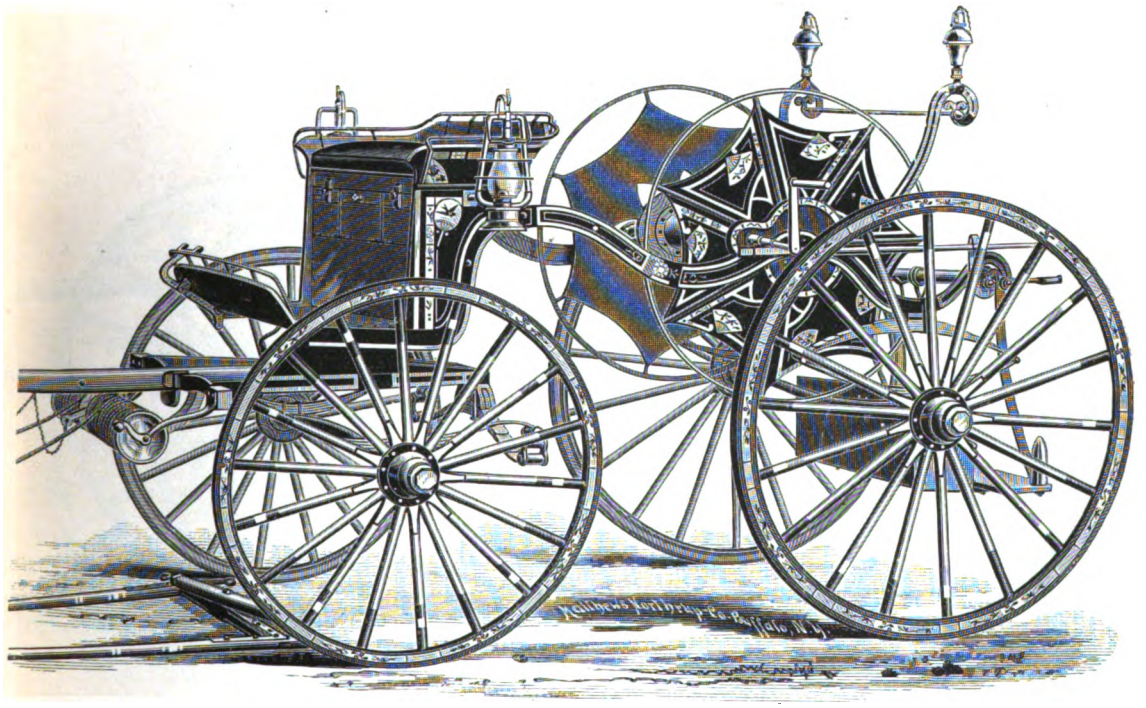

FIG. 90.

This carriage is fitted to be drawn by either a horse or men, having shafts for the former and a tongue, rope reel, and drag rope for the latter, readily transferable. The reel has capacity for 750 feet of rubber fire hose, and is operated by cranks and gears; it has a friction brake, worked by the driver's foot. The front springs are of the platform style, and in the rear are elliptic springs, all oil tempered and made of the best Swedes steel. The carriage has steel axles and the latest improved wheels, with steel tires. There is a platform behind for men to ride on, with leather-covered hand-rail, and covered with rubber matting.

The carriage is supplied with the necessary appurtenances, consisting of two hand lanterns, a pair of torches, holders for two play pipes, gong, axe, crow-bar, cushion, whip socket, boxes for tools, etc., and three wrenches. It is handsomely painted, and the trimmings and fixtures are polished and nickel plated.

Dimensions: Length, 17 feet 10 inches; width, 5 feet 9 inches; height, 8 feet 6 inches. Weight, 1,200 pounds. Price, $850.

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PARADE HOSE CARRIAGE.

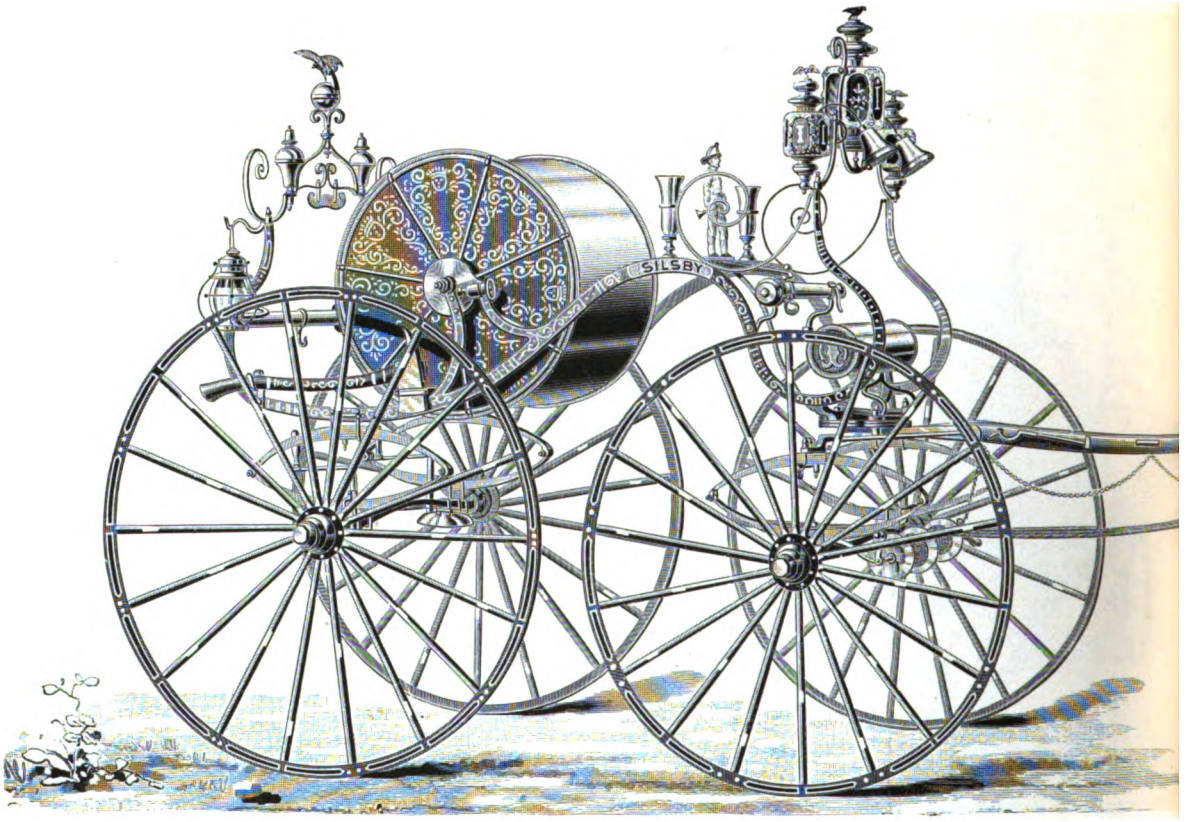

FIG. 110.

The carriage shown in our illustration was built more particularly for parade purposes, but by removing the drum from the reel it is equally adapted for actual fire duty. It is very artistic in appearance, and shows superior workmanship in both design and finish, all metal parts, excepting the frame and the tires on the wheels, being highly polished and nickel plated. The frame, wheels, and tongue are beautifully painted. The carriage has steel axles, with Sarven wheels and steel tires, and is hung on either scroll elliptic or plain elliptic springs. The reel has engraved metal heads, is worked by cranks and gears, and is supplied with a friction brake. The carriage is furnished with lamps, bells, lanterns, etc., etc., as shown in cut. There are two engraved name-plates, one on either side of frame; and the metal tool box has gold-plated raised letters and figures, giving the name and number of company. The metal drum that surrounds the reel also gives the name and number of the company, or other suitable device, in gold-plated letters.

Size.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	600 feet	1,250 lbs.	17 ft. 3 in.	5 ft. 7 in.	8 ft. 8 in.	$1,600
No. 2	500 feet	900 lbs.	16 ft. 9 in.	5 ft. 7 in.	8 ft. 4 in.	1,500
No. 3	350 feet	850 lbs	16 ft. 9 in.	5 ft. 7 in.	8 ft. 4 in.	1,450

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DUTY HOSE CARRIAGE.

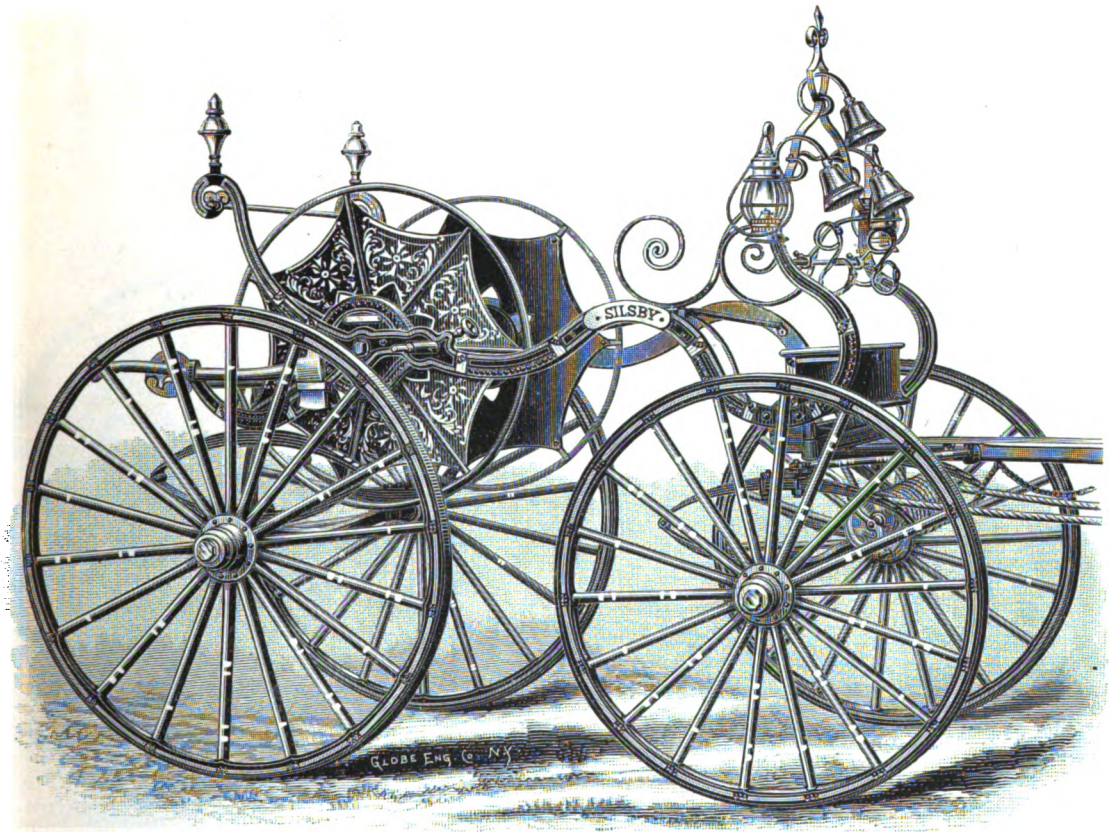

FIG. 130.

This carriage is intended principally for active service, but is showy enough for parade use as well.

It has Sarven wheels and steel tires, with steel axles and elliptic springs. The reel is worked by cranks and gears, and is supplied with a friction brake.

The carriage is furnished complete with the necessary appurtenances, and the following articles are polished and nickel plated: Bells and bell springs (3), lanterns and lantern hooks (2), torches (2), holders for play pipes (2), rope and reel brackets, tongue crab, handles, and chain; reel crank shafts, cranks, and brake: name-plates (engraved), axe and axe holders, hub caps and bands, trimmings on rear hose roller, etc., etc.

Size.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	650 feet	1,175 lbs.	17 ft. 2 in.	5 ft. 8 in.	7 ft. 4 in.	$700
No. 2	550 feet	1,100 lbs.	17 ft. 1 in.	5 ft. 8 in.	7 ft. 4 in.	675
No. 3	450 or 500 ft.	1,000 lbs.	17 ft.	5 ft. 8 in.	7 ft. 4 in.	650

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SPIDER HOSE CARRIAGE.

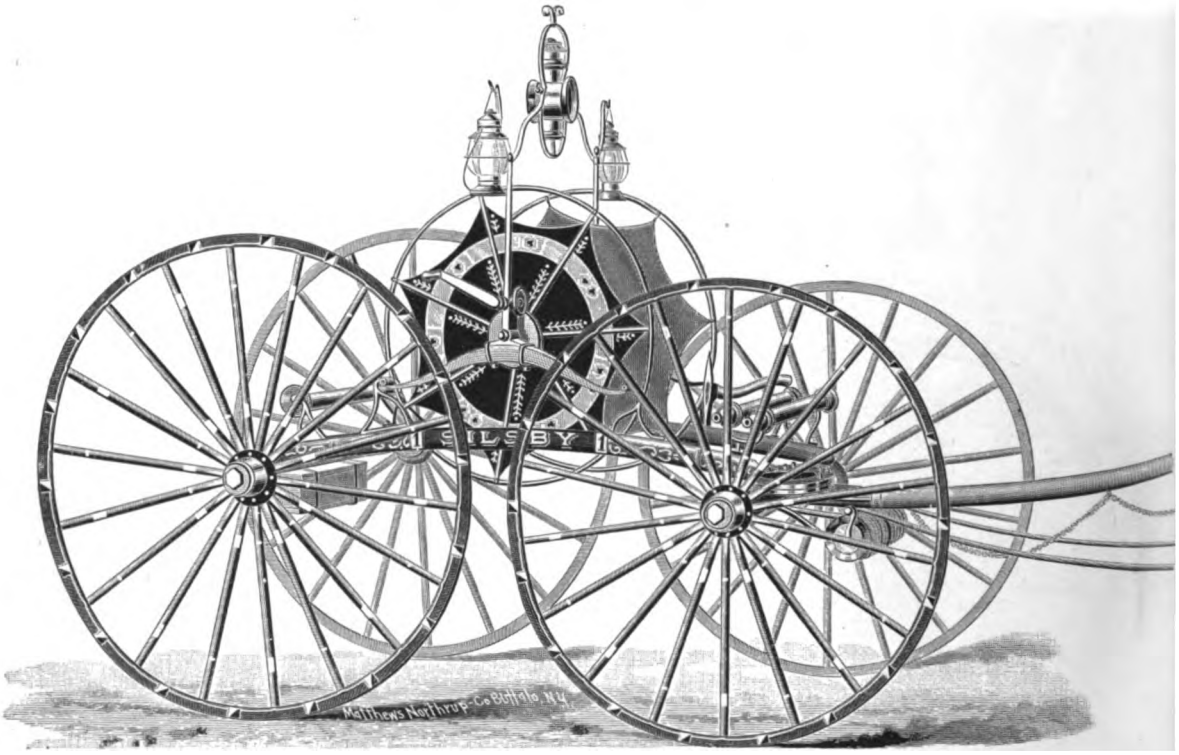

FIG. 140.

Our spider carriages are built in a number of different sizes, and, as far as details of construction and the degree of ornamentation are concerned, in a variety of styles. (Photographs and specifications will be sent on application.) The carriage shown in the above cut is adapted for both actual fire service and parade purposes. It has Sarven wheels with steel tires, and the axles are also steel. The reel is worked by means of right and left hand cranks and gears, and is supplied with a friction brake.

The carriage is furnished complete with a swinging reflector signal lamp, with colored glass suitably engraved, two hand lanterns, two play pipe holders, rope reel with 100 feet cotton drag rope, gong, axe, crow-bar, tool box, and three wrenches.

Size and Style.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	500 feet	600 lbs.	16 ft. 3½ in.	5 ft. 7 in.	9 ft.	$600
No. 2	300 feet	500 lbs.	16 ft. 3½ in.	5 ft. 7 in.	7 ft. 9 in.	550

The following parts are polished and nickel plated, namely: Signal lamp (has colored engraved glass in rear), lanterns, gong, axe, crow-bar, hose reel cranks, rope reel heads and cranks, tongue crab and side handles, hub caps and bands, and ends of rear hose roller. The rest of the carriage is handsomely painted, with gold striping and ornamentation, the whole making a neat, tasty, and elegant vehicle.

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SPIDER HOSE CARRIAGE.

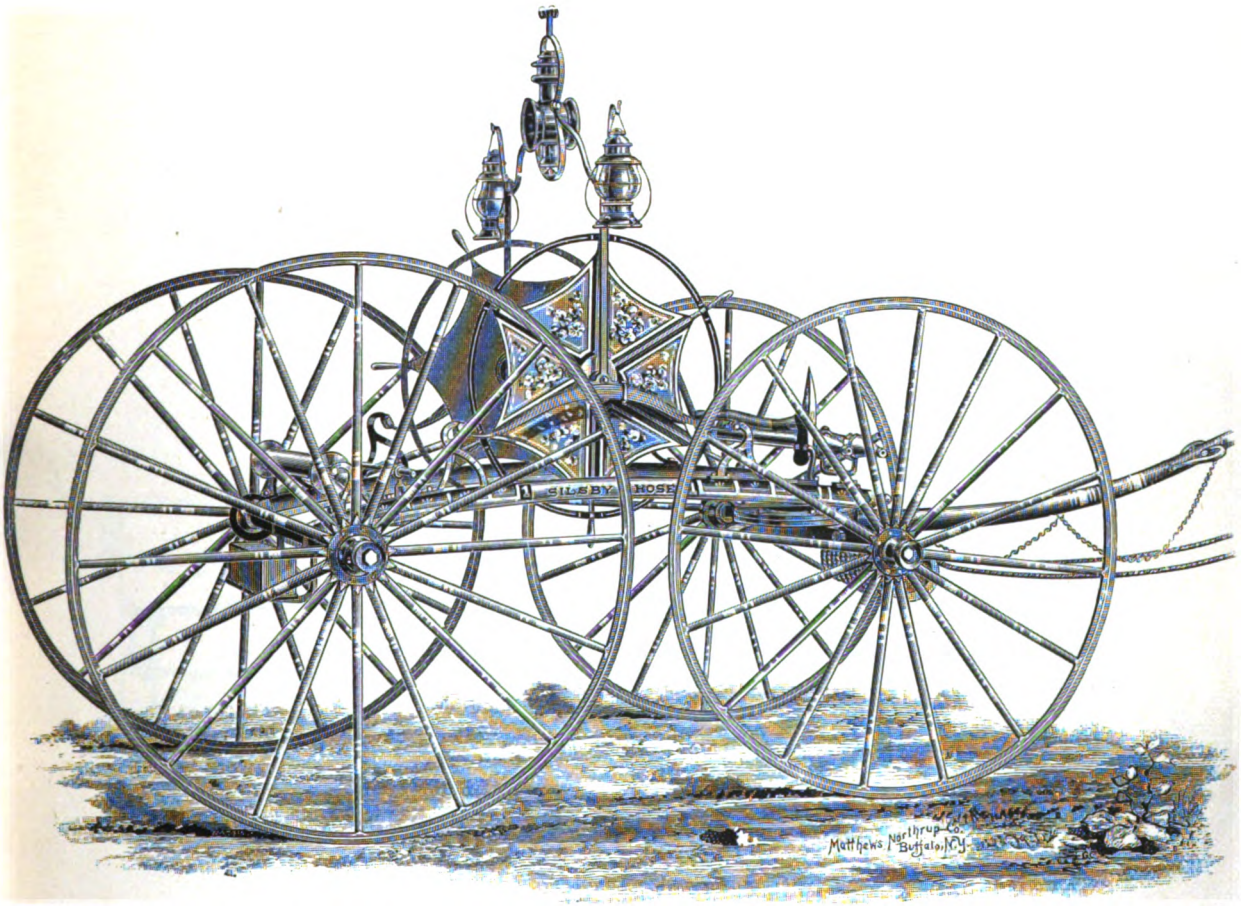

FIG. 150.

This carriage, also, is adapted for both actual fire service and parade purposes, and is precisely like the one shown on the preceding page, excepting that the reel is operated by handles.

The following parts are polished and nickel plated, namely: Signal lamp (has colored engraved glass in rear), lanterns, gong, axe, crow-bar, hose reel handles, rope reel heads and cranks, tongue crab and side handles, hub caps and bands, and ends of rear hose roller. The rest of the carriage is handsomely painted, with gold striping and ornamentation, the whole making a neat, tasty, and elegant vehicle.

Size and Style.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	500 feet	600 lbs.	16 ft. 3½ in.	5 ft. 7 in.	9 ft.	$550
No. 2	300 feet	500 lbs.	16 ft. 3½ in.	5 ft. 7 in.	7 ft. 9 in.	500

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HAND HOSE CART.

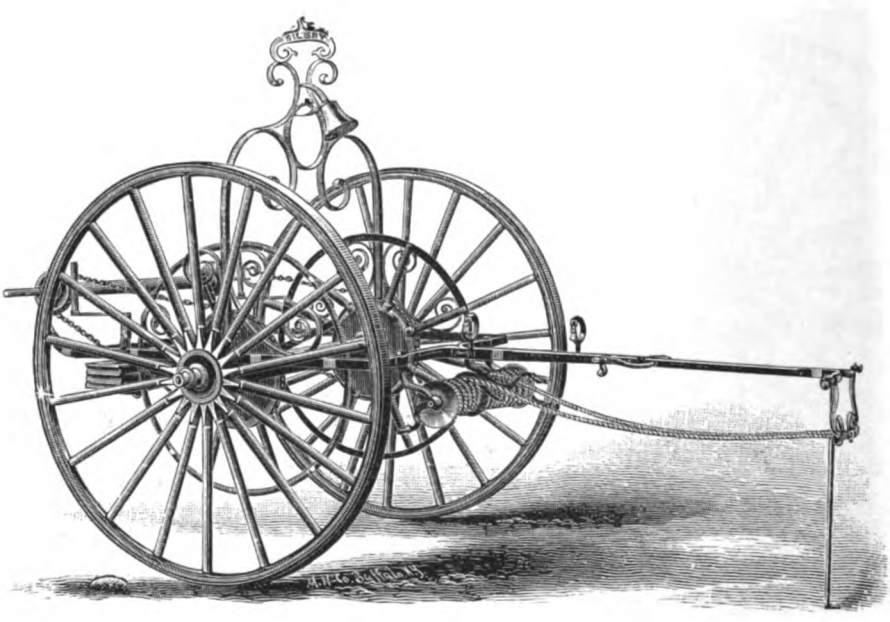

FIG. 160.

The capacity of this cart is 600 feet of rubber fire hose, and it is properly balanced. The frame and tongue are forged in one piece from Burden iron, and it is mounted on iron-hubbed wheels with steel tires. The reel is operated by means of right and left-hand cranks and chains.

The cart is supplied with scroll arch, bell, and name-plate, 100 feet of manila drag rope, rope reel, holders for play pipe, axe, tool box, and wrenches.

The cart is nicely painted, with gold striping, and the name-plate, bell, and hub caps are nickel plated.

Dimensions: Length, 10 feet 5 inches; width, 5 feet 8 inches; height, 7 feet 3 inches. Weight, 800 pounds. Price, $235.

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HAND HOSE CART.

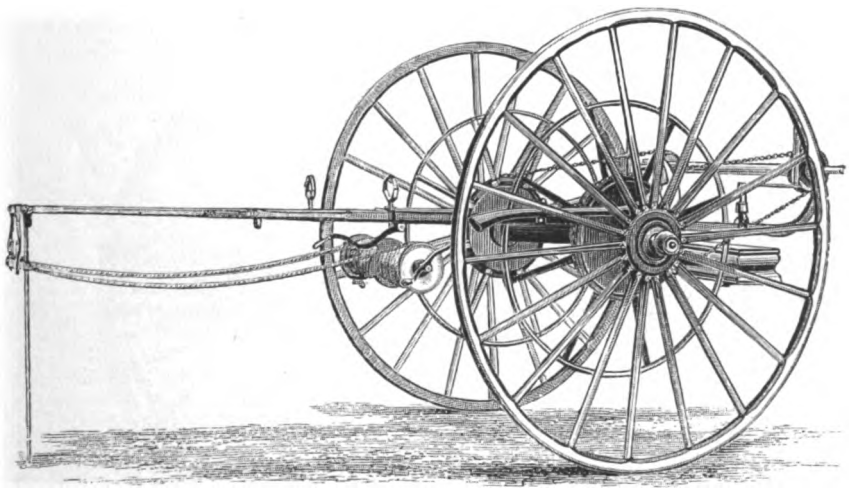

FIG. 170.

This cart is substantially built, the frame and tongue being forged from Burden iron, in one piece. The reel has capacity for 600 feet of rubber fire hose, and is worked by cranks and chains. It has iron-hubbed wheels with steel tires; and is precisely the same as the Fig. 160, excepting that it has no scroll arch, bell, or name-plate, but the name and number of company may be painted on the tool box.

The appurtenances consist of 100 feet of manila drag rope, rope reel, holders for play pipe, axe, tool box, and wrenches. The painting is neatly done, with gold striping, and the hub caps are nickel plated.

Dimensions: Length, 10 feet 5 inches; width, 5 feet 8 inches; height, 5 feet 2¾ inches. Weight, 675 pounds. Price, $185.

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HAND HOSE CART.

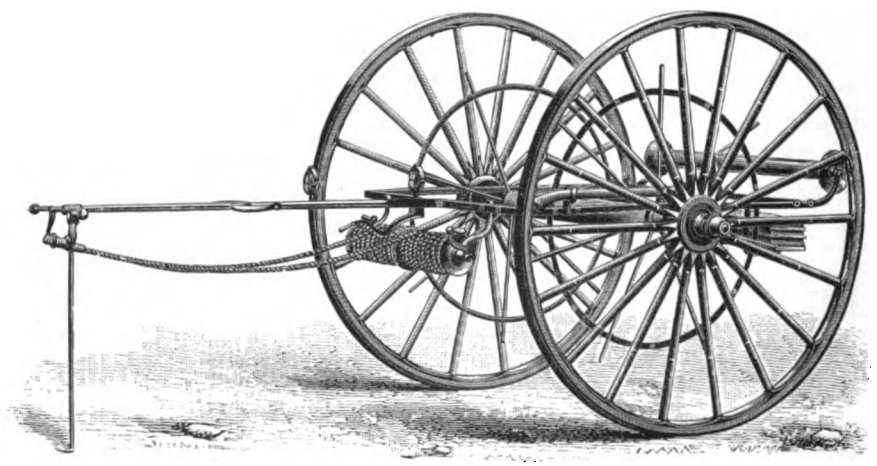

FIG. 180.

This cart is substantially the same as the preceding one, excepting that the reel is operated by means of handles instead of cranks and chains. It will hold 600 feet of rubber fire hose. The frame and wheels, and also the appurtenances, are the same; these latter consist of rope reel and drag rope, holders for play pipe, axe, tool box, and wrenches. The painting is English vermilion, nicely striped, and the hub caps are nickel plated.

Dimensions: Length, 10 feet; width, 5 feet 8 inches; height, 5 feet 2⅝ inches. Weight, 500 pounds. Price, $125.

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PATENT TUBULAR HOSE CART.

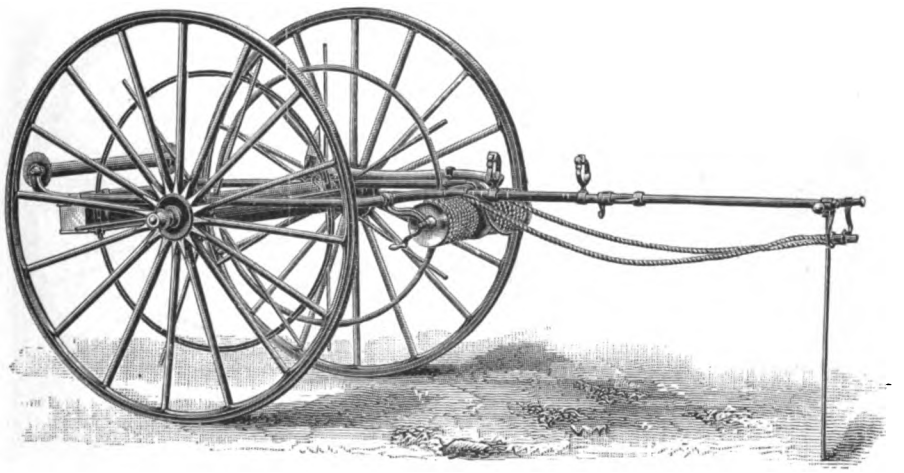

FIG. 190.

The frame of this cart is made of wrought-iron tubing, with suitable patent fittings of our own design. The reel is worked by means of handles. The axle is of steel, and the iron-hubbed wheels have steel tires. The cart is nicely painted and striped, and the hub caps are nickel plated.

The appurtenances consist of rope reel and drag rope, holders for play pipe, axe, tool box, and wrenches.

Dimensions: Length, 9 feet 10 inches; width, 4 feet 11 inches; height, 4 feet 10 inches. Weight, 350 pounds. Price, $100.

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STEEL HOSE CART.

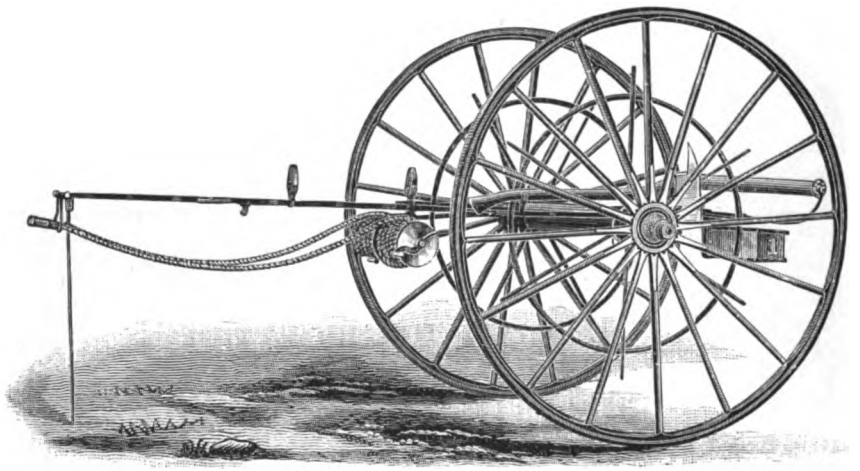

FIG. 200.

This cart, owing to its extraordinary lightness and convenience (it may be run on the sidewalk if desired), is meeting with great favor. The frame and axle are of steel, and it has light but strong iron-hubbed wheels with steel tires. The reel has capacity for 400 feet of rubber fire hose, and is worked by handles.

The cart is supplied with rope reel and drag rope, holders for play pipe, axe, tool box, and wrenches.

It is handsomely painted, with gold striping, and the hub caps are nickel plated.

Dimensions: Length, 9 feet 3 inches; width, 5 feet; height, 4 feet 10 inches. Weight, 265 pounds. Price, $125.

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RACING HOSE CART.

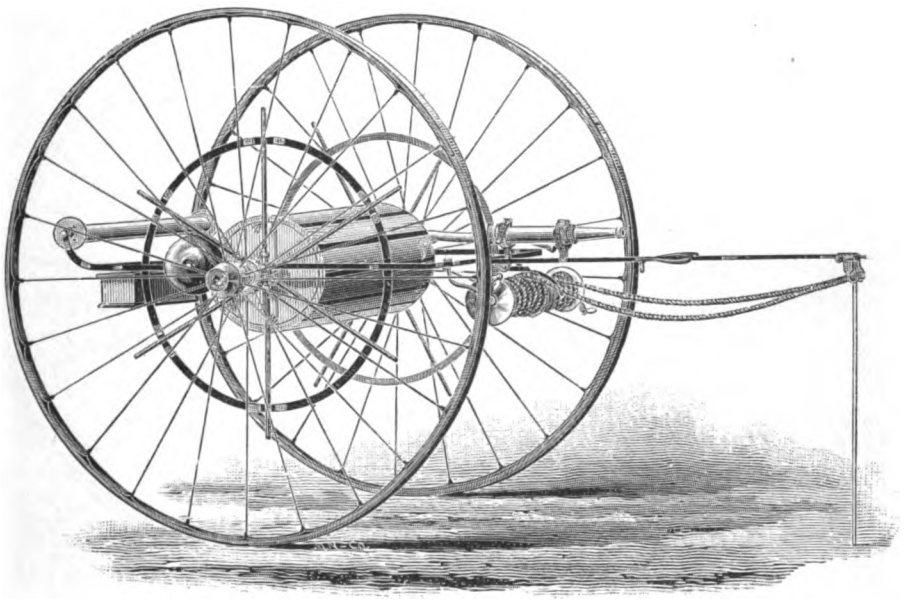

FIG. 210.

This cart has a steel frame and steel axle, and is balanced on nickel-plated bicycle wheels. The reel is worked by handles, and has capacity for 300 feet of rubber fire hose.

The cart is furnished complete with tournament play pipe and nozzle, together with gong, all of which are polished and nickel plated ; also drag rope, rope reel, axe, tool box, and wrenches.

The cart is handsomely painted, with gold striping, and the dimensions are as follows : Length, 9 feet 5 inches ; width, 5 feet 1 inch ; height, 6 feet. Weight, 350 pounds. Price, $200.

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PATENT RACING HOSE CART.

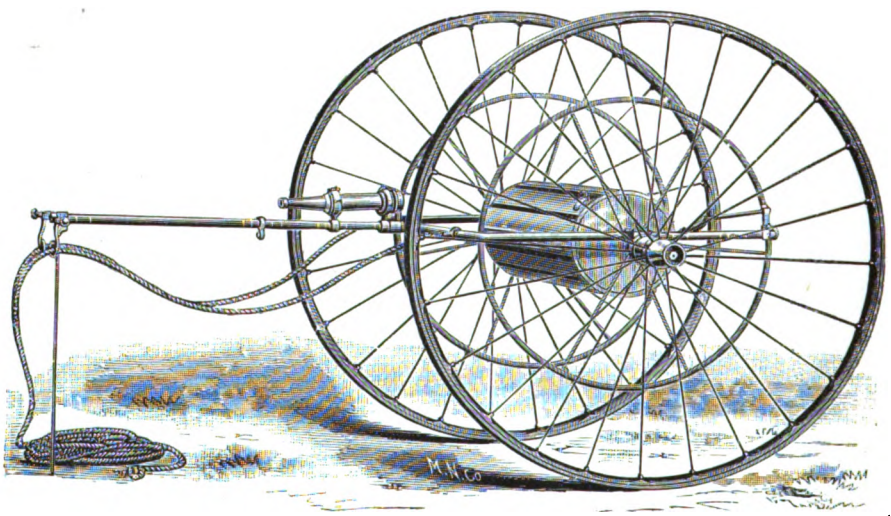

FIG. 220.

The frame and tongue of this cart are made of tubing, with our patent steel fittings. There is only one joint, at the tongue, fitted with a right and left hand thread, giving strength and rigidity to the frame. The axle is of steel, and the wheels are of the bicycle pattern, with steel tires, the hubs, spokes, etc., being finished and nickel plated. The tread of wheels is four feet two inches. The play pipe and nozzle are also plated, and the cart is supplied with drag rope and wrenches. The reel will carry 300 feet of rubber fire hose, and is operated by means of rings. It has a wooden drum, and hook to facilitate winding on the hose.

The cart is nicely painted and striped, and has the following dimensions: Length, 9 feet 8 inches; width, 5 feet; height, 6 feet. Weight, 315 pounds. Price, $150.

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PATENT RACING HOSE CART.

WITH BICYCLE WHEELS.

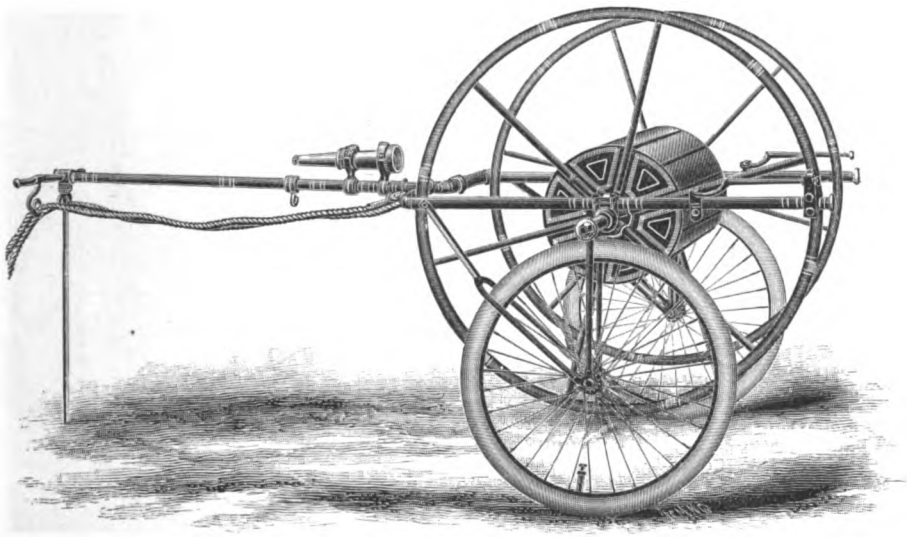

FIG. 221.

This cart is precisely the same as the one described on the preceding page (Fig. 220), with the addition of bicycle wheels having *ball bearings and pneumatic tires*, shown in the above illustration. the weight with these being 190 pounds.

This attachment can be easily and quickly substituted for the six-foot wheels, and *vice versa*, and the height of the reel from the ground is the same in either case. Price, with both styles of wheels and air pump for pneumatic tires, $300.

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PATENT MILL HOSE CART.

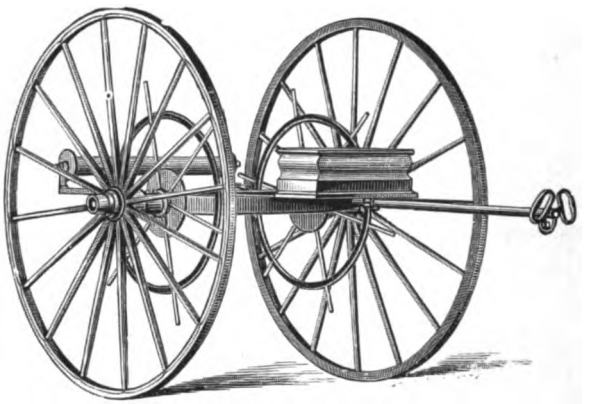

FIG. 241.

These carts are made of wrought-iron tubing, with our own special fittings, and are strong and durable, but at the same time light and easy to handle. They have steel axles, and wooden wheels with steel tires; and are particularly adapted for use about mills, factories, and public buildings. Furnished with bicycle wheels if preferred.

The cart is furnished with tool box and hose spanners, and is nicely painted and striped.

Size.	Capacity, Rubber Hose.	Weight.	Length.	Width.	Height.	Price.
No. 1	500 feet	225 lbs.	9 ft. 1 in.	4 ft. 11 in.	4 ft. 10 in.	$80
No. 2	300 feet	130 lbs.	8 ft. ½ in.	4 ft. 5 in.	4 ft.	60
No. 3	200 feet	120 lbs.	7 ft. 4 in.	4 ft. 5 in.	3 ft. 6 in.	50

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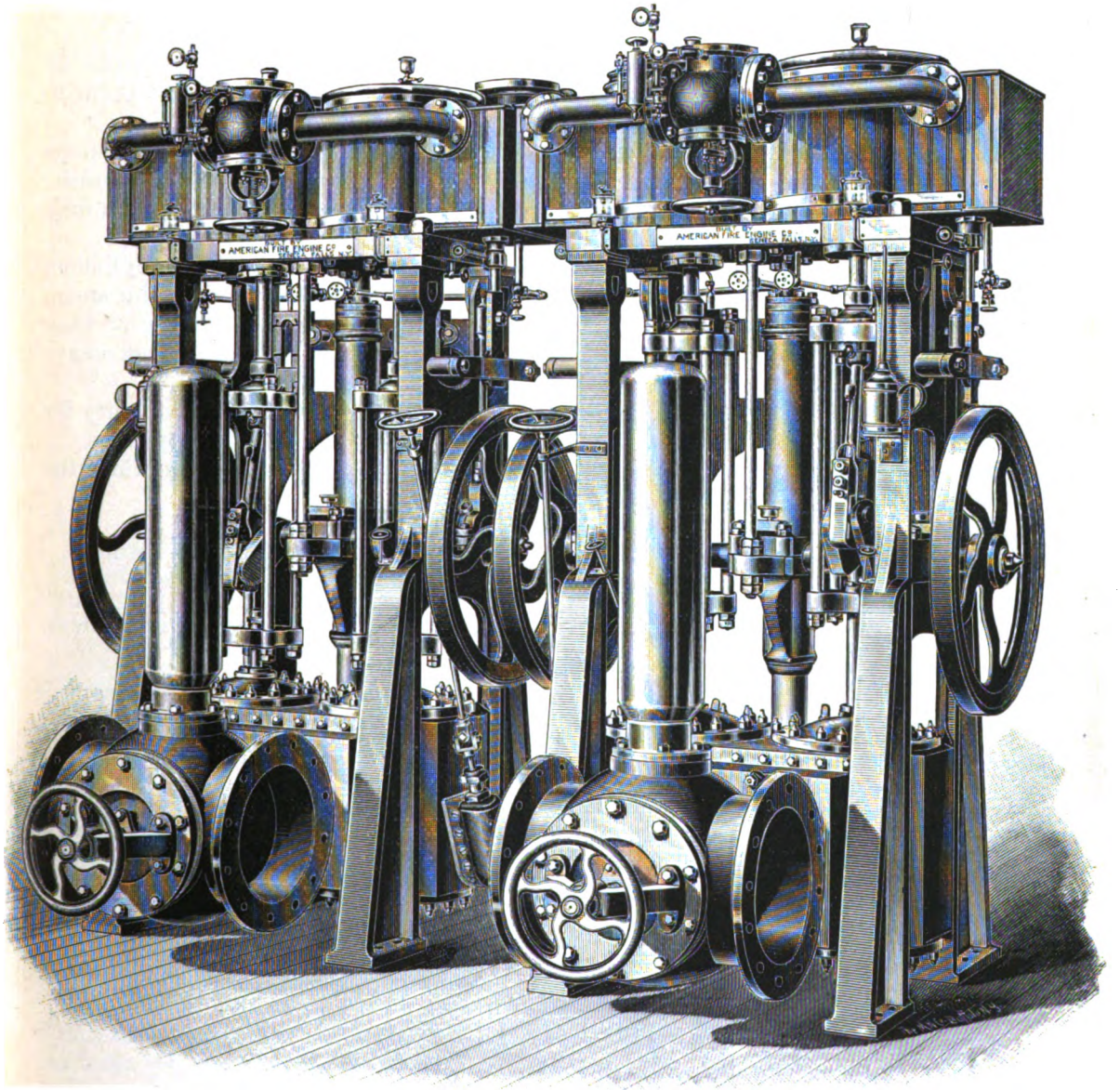
IMPROVED C. & J. FIRE BOAT PUMPS.



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FIRE BOAT PUMPS.

We are the manufacturers of the pumps used on most of the Fire Boats in use in this country, and their long and successful service has conclusively proved them to be the best pump for this special and heavy work.

To give some little idea of the work capable of being performed by these pumps we will say that, at the test of the Fire Boat "Geyser" at Chicago, in November, 1886, the pumps threw four 2-inch streams to a distance of 249 feet, one 4-inch stream 396 feet, and *fourteen* 1¼-inch streams 204 feet.

The pumps are vertical and double acting. They are driven by steam cylinders having improved balanced piston valves, and are so constructed that the steam may be worked with any desired expansion, thus insuring great economy of fuel. These fire pumps are furnished with or without the connections and fittings necessary for their use in boats.

They are built in two sizes, a set of the larger pumps having capacity for discharging 9,000 gallons of water per minute, and the smaller size 6,500 gallons.

Among the Fire Boats equipped with these pumps we may mention the following :—

New York, N. Y.

Fire Boat "New Yorker," . . . . . Fire Department.
Fire Boat "Zophar Mills," . . . . . Fire Department.
Fire Boat "Pier," . . . . . Dock Department.
Fire Boat "Patrol," . . . . . Police Department.

Chicago, Ill.

Fire Boat "Geyser," . . . . . Fire Department.

Philadelphia, Pa.

Fire Boat "Edwin S. Stuart," . . . . . Fire Department.

Brooklyn, N. Y.

Fire Boat "Seth Lowe," . . . . . Fire Department.
Fire Boat "David A. Boody," . . . . . Fire Department.

Boston, Mass.

Fire Boat Engine No. 31, ... Fire Department.

Seattle, Wash.

Fire Boat "Snoqualime," . . . . . Fire Department.

Standard Oil Company.

Fire Boat "Imperator."
Fire Boat "Astrol."
Fire Boat "Acme."

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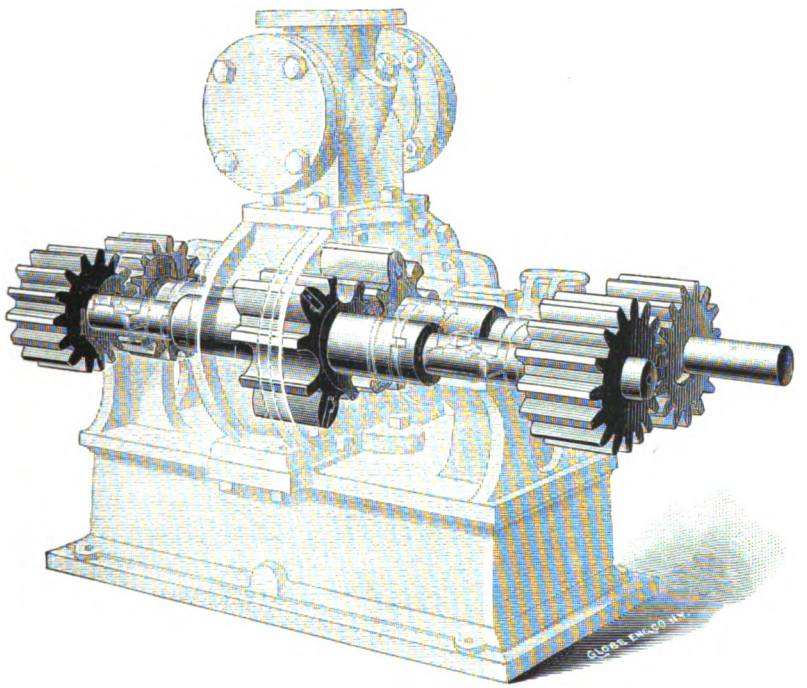
HOLLY ROTARY PUMPS.



The above cut illustrates the Holly Rotary Pump and its construction, but is intended more particularly to show plainly the working parts. These consist of a pair of corrugated cams working together within an elliptical case, the ends of the long teeth being packed by blocks of metal inserted into the grooves and pressed out by springs, thus insuring a perfect vacuum and the taking up of any slight wear there may be after years of pumping.

The water enters at the bottom through the suction, the stream dividing and filling the chambers made by the long teeth, passing around the cams, and discharging from the top through the outlet. The motion of the pump is equable, continuous, and rotary, the cams working together inward from the top. Thus, even with the No. 1 and No. 2 pumps, in which each cam has but two long teeth instead of three,

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when one chamber has just discharged, another is discharging, another one is on its way, and still another one is just filling, so that the stream is always uniform and steady.

The vacuum made by this pump is perfect, insuring the immediate picking up of the water. There are no "dead points" to it, and the instant the pump is started the air commences to exhaust in the suction pipe and does not cease until the whole is exhausted and the water rises.

The water spaces are large, allowing free passage for any foreign matter that may enter the pump, and sandy, dirty, or gritty water can be worked with less injury than in any other pump.

There being in the Holly Pump an entire absence of such working parts as valves and other adjuncts, which cause complication, friction, and liability to derangement in other pumps, it is without doubt the most reliable pump yet invented, a great desideratum when used for fire purposes or other particular work. Sticks, sawdust, leaves, etc., cannot clog it, and anything liable to enter the suction can pass through the pump with certainty and without interruption.

We guarantee these pumps to lift water from 25 to 28 feet perpendicularly, and to force it to any height or distance that may be necessary. If the suction pipe is air-tight, these pumps will draft water almost any distance horizontally. They will not only do all the work that can be performed with other pumps, but, from their construction, will do work that it is impossible for any other pump to accomplish.

NOTE.—The horse-power required for operating each pump, as given in our tables, is such as would be needed to perform the work set down for that particular pump and *elevate the water to a height of 100 feet*, abundant allowance being made for running the pump and necessary transmitting machinery. For instance, to run the No. 3 power pump 135 revolutions per minute, discharging 112 gallons and elevating it to a height of 100 feet, 4¼ horse-power should be used; while to run the No. 3 fire pump at 400 revolutions and discharge 333 gallons per minute, throwing the streams 100 feet high, 25 horse-power would be required. The power necessary will, in all cases, be more or less in proportion to the height the water is to be elevated, and we simply give these figures as a guide for our patrons in making their calculations. If a fire pump is to be used for the protection of very high buildings, and it is desired to force the streams to a great distance, or otherwise perform extraordinary service, 30 to 50 per cent. additional power could be used to advantage.

Although our illustrations show power and fire pumps to be run either by belt or coupling, any of them can be run by gears, common clutch, or friction clutch, and are so arranged when specially ordered.

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GENERAL DIRECTIONS.

FOR SETTING UP PUMPS.

Attach large suction pipe, and be sure that it is perfectly air-tight. There is no danger of getting suction pipe too large, though much extra power is required and the effectiveness of the pump is impaired by using too small a one.

Belt or gear so as to have the *outer gears of the pump run inward from the top.*

The couplings on end of driving shaft should not be screwed up tight, but left a little loose, so as to conform to any deviation there may be from a true line in the bearing of the countershaft and the bearings of the pump.

The quantity of liquid discharged by these pumps is in exact proportion to the number of revolutions made. For example, our No. 5 pump discharges two gallons each revolution : thus when making 100 revolutions per minute, 200 gallons would be discharged ; at 200 revolutions, 400 gallons ; and at 300 revolutions, 600 gallons. It must be borne in mind that the speed at which each pump should be run, as stated in the following tables, is that best adapted for constant and steady work. For occasional use, or under special circumstances, the number of revolutions (or speed) can be safely increased.

Keep the bearings well oiled ; and when the pump is not in constant use, to prevent rusting, there should be a little good oil poured into it each time after using it, and the pump turned a few times by hand so as to spread the oil.

When water has to be drafted or forced a long distance, avoid angles in the pipe as much as possible, and thus save friction.

Special directions for setting up and operating sent with any pump, when necessary, or when built for particular work.

TO BE OBSERVED IN ORDERING PUMPS.

State plainly the kind of pump wanted, giving Fig. and No. in catalogue.

Please give plain shipping directions, stating whether pumps are to be sent by freight or express.

State if pumps are to be used for pumping hot or cold liquids.

When practicable, mention what duty the pump is required to perform, giving full particulars, such as the quantity of water to be pumped and the height it is to be raised, or the quantity and pressure per square inch.

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HAND PUMPS.

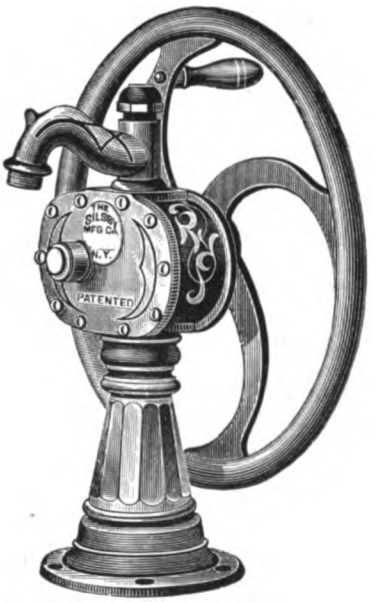

FIG. 260.

These pumps are designed for cisterns and shallow wells (when not exposed to frost), and for forcing water through houses to upper stories, bath-rooms, etc., by means of pipe screwed to top of pump; also for "racking" purposes in wine cellars, breweries, cider and vinegar factories, etc., for pumping oil, beer, etc., and in fact for all purposes where a small quantity of liquid is required to be lifted and forced by hand.

There is a thread cut on the end of the spout, for the attachment of hose in case of fire, or for washing carriages and windows, and sprinkling lawns, gardens, etc. One man can force a half-inch stream of water a distance of from 50 to 100 feet from the nozzle. If not required to lift the water more than 8 or 10 feet, the check-valve can be dispensed with, so as to lessen the danger of freezing, should the pump be placed in an exposed situation.

Size.	Capacity Each Revolution, Gallons.	Capacity per Minute, Gallons.	Diameter of Suction, Inches.	Diameter of Discharge, Inches.	Diameter of Base, Inches.	Height, Inches.	Diameter of Wheel, Inches.	Prices.	
								Iron.	Bronze.
No. 1	$\frac{1}{7}$	10 to 15	$1\frac{1}{4}$	1	8	$22\frac{3}{4}$	20	$19	$40
No. 2	$\frac{1}{5}$	15 to 20	$1\frac{1}{2}$	$1\frac{1}{2}$	$10\frac{1}{2}$	$27\frac{3}{4}$	24	27	60
No. 3	$\frac{1}{5}$	20 to 25	2	$1\frac{1}{2}$	15	40	*24	35	70

*This pump (No. 3) has also a crank fitted to opposite side of pump, so that two or four men can work it at once if necessary.

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HAND OR POWER PUMP.

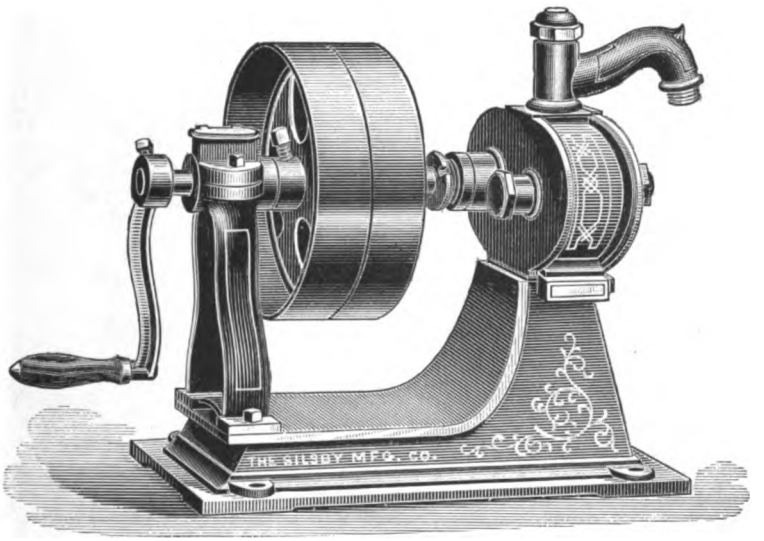

FIG. 290.

This pump is fitted to be operated by either hand or power, and is adapted to a great variety of uses where a small quantity of liquid is to be lifted. It requires but very little power, and is simple, compact, and durable, being far superior to this class of pumps as ordinarily constructed.

The capacity is ¼ gallon each revolution. It has a 1¼-inch suction and 1-inch discharge. For constant use the pump may be run at 175 revolutions per minute, when it will supply about 25 gallons per minute, but it can be run at a much higher speed if desired.

Dimensions: The base is 9¼ by 20 inches; height from bottom of base to center of shaft, 11¼ inches; total height, 18¼ inches; total length, 25½ inches. The pulleys usually furnished are 2 inches by 10½ inches, but any size pulleys can be used from 6 inches in diameter up to 16 inches.

Prices: Iron, $25.00; Bronze, $50.00.

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OIL PUMP.

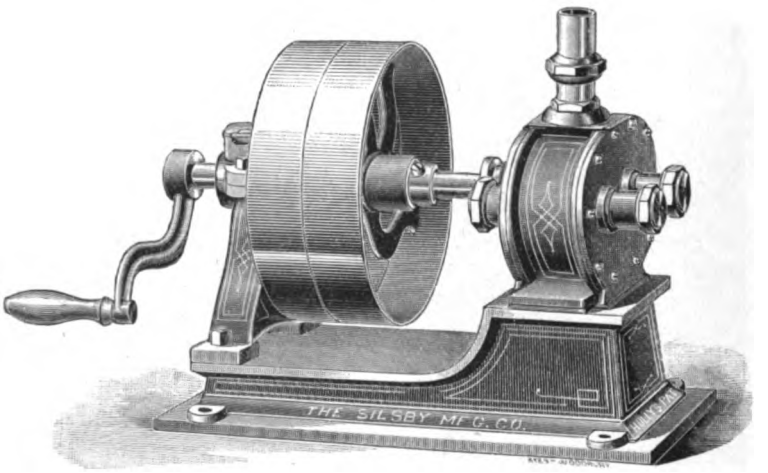

FIG. 300.

This pump is built especially for pumping oil. It is very simple in construction, having no valves and only one stuffing-box, and requires but little power to operate it.

Large numbers of these pumps are in use in oil refineries throughout the country, and, having been thoroughly tested for many years, are found to give perfect satisfaction.

This pump, as shown in the illustration, is also adapted to be worked by hand.

These pumps are made of bronze, when so ordered, for pumping acids, alkalies, etc.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Total Length, Inches.	Diameter of Suction, Inches.	Diameter of Disch'ge, Inches.	Size of Pulleys, Inches.	Prices.	
											Iron.	Br'nze.
No.1	$\frac{1}{7}$	175	25	$9\frac{1}{8}\times19\frac{1}{2}$	$8\frac{1}{2}$	$15\frac{1}{2}$	$25\frac{1}{2}$	$1\frac{1}{4}$	1	$10\frac{1}{2}\times2$	$25	$50
No.2	$\frac{1}{5}$	175	35	$9\frac{1}{8}\times19\frac{1}{2}$	$8\frac{1}{2}$	$15\frac{1}{2}$	$25\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$10\frac{1}{2}\times2$	40	65

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POWER PUMP.

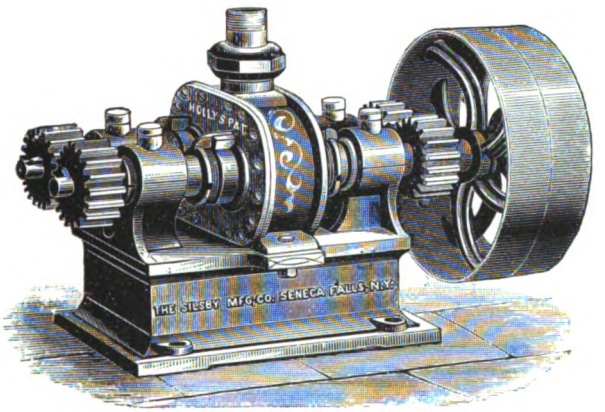

FIG. 310.

The above cut represents our smallest pump for power alone.

It is substantially built of the best materials, with steel shafts of sufficient strength to withstand any ordinary pressure.

This pump is double-geared, with outside bearings, and is furnished with tight and loose pulleys, 10½ inches in diameter and with 2-inch faces. Suction and discharge, 1¼ inches in diameter; capacity, ⅓ gallon each revolution. For steady and continuous work this pump should be run at 200 revolutions per minute, when it will pump 23 gallons per minute, requiring less than one horse-power (.87) to elevate the water 100 feet. This speed can be safely increased, if necessary, for special occasions.

Dimensions: Base, 9 by 13½ inches; height from bottom of base to center of shaft, 7⅛ inches; total height, 16¾ inches; length, 22 inches.

Prices: Iron, $75.00; Bronze, $110.00.

NOTE.—Unless otherwise ordered the discharge or outlets of the bronze pump will be made as shown in above cut, and the iron pump will be fitted with a "cross," so that pipe can be attached to top or on either side.

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POWER PUMP.

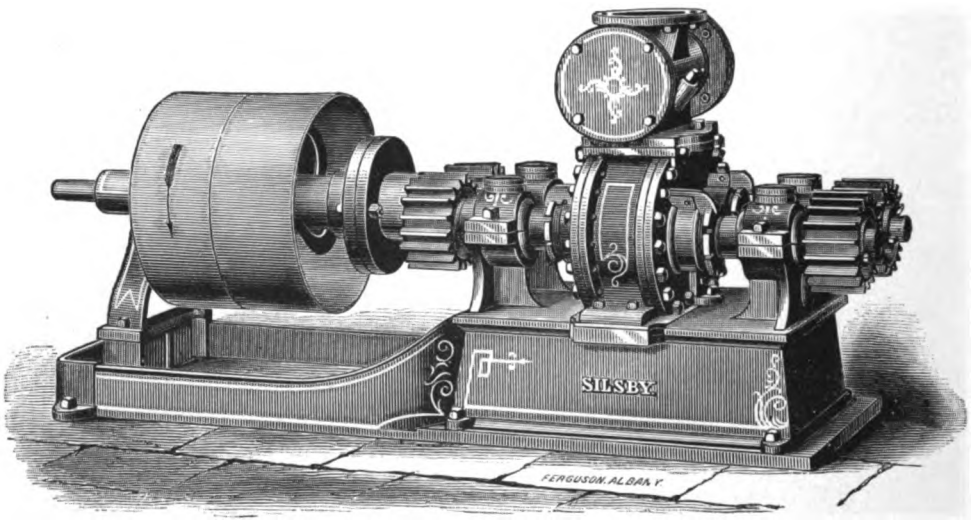

FIG. 320.

As will be seen, these pumps are built on a long solid frame, and are double-geared, with outside bearings, countershaft, pulleys, and standard, thus taking off from the pump all strain of the belt. They are very easily set up, as only the suction pipe has to be attached, and the base of the pump firmly bolted on to the place where it has to rest, and the pump is ready for the driving belt.

These are very useful pumps for supplying different stories of a building with water, where there is a reservoir under the roof, and for general pumping purposes.

The countershaft on these pumps will be connected to right-hand end of pump shaft, as shown in cut, unless specially ordered. It will be seen that, by turning the pump end for end, the pump can be made to run in the reverse direction from that shown in cut.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Length, Inches.	Diameter of Suction and Disch'ge, Inches.	Size of Pulleys, Inches.	Horse Power.	Prices.	
											Iron.	Br'nze.
No.2	$\frac{1}{5}$	175	35	$11\frac{1}{2}\times48$	$8\frac{7}{8}$	$19\frac{3}{8}$	58	$2\frac{1}{2}$	$11\frac{1}{2}\times2\frac{1}{2}$	1.33	$135	$200
No.$2\frac{1}{2}$	$\frac{1}{2}$	150	75	$12\frac{1}{8}\times58\frac{1}{2}$	$10\frac{1}{4}$	$23\frac{1}{2}$	67	$3\frac{1}{4}$	$15\frac{1}{2}\times6$	2.85	185	285
No.3	$\frac{5}{6}$	135	112	$18\times63\frac{3}{4}$	$13\frac{5}{8}$	28	72	4	$15\frac{1}{2}\times6$	4.25	240	430
No.4	$1\frac{1}{4}$	110	137	$20\frac{1}{8}\times74\frac{1}{2}$	$14\frac{1}{4}$	30	83	$4\frac{1}{2}$	20×7	5.20	280	485

See note on next page.

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POWER PUMP.

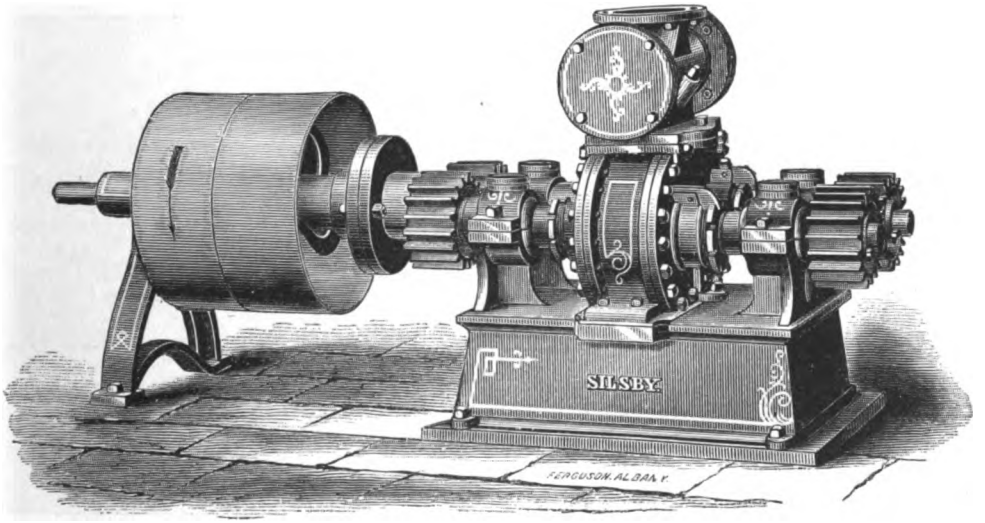

FIG. 330.

This pump is practically the same as the one shown on preceding page, the only difference being that it is mounted on a short instead of a long frame.

The countershaft can be connected to either end of pump.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Length, Inches.	Diameter of Suction and Disch'ge, Inches.	Size of Pulleys, Inches.	Horse Power.	Prices.	
											Iron.	Bronze.
No. 2	$\frac{1}{6}$	175	35	$11\frac{3}{8}\times20\frac{1}{2}$	$8\frac{7}{8}$	$19\frac{3}{8}$	44	$2\frac{1}{2}$	$11\frac{1}{2}\times2\frac{1}{2}$	1.33	$125	$190
No. $2\frac{1}{2}$	$\frac{1}{2}$	150	75	$12\frac{1}{8}\times25\frac{1}{8}$	$10\frac{1}{4}$	$23\frac{1}{2}$	61	$3\frac{1}{4}$	$15\frac{1}{2}\times6$	2.85	175	275
No. 3	$\frac{5}{6}$	135	112	$18\frac{1}{8}\times26\frac{1}{4}$	$13\frac{5}{8}$	28	64	4	$15\frac{1}{2}\times6$	4.25	230	420

NOTE.—Unless otherwise ordered, the discharge or outlets of the iron pumps on this and the preceding page will be made as shown on above cut, and those of the Nos. 2 and $2\frac{1}{2}$ bronze pumps the same as shown in cut of Power Pump No. 1. In any of our pumps, whether of iron or bronze, the discharge can be especially adapted for any particular purpose, if so desired.

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POWER PUMP.

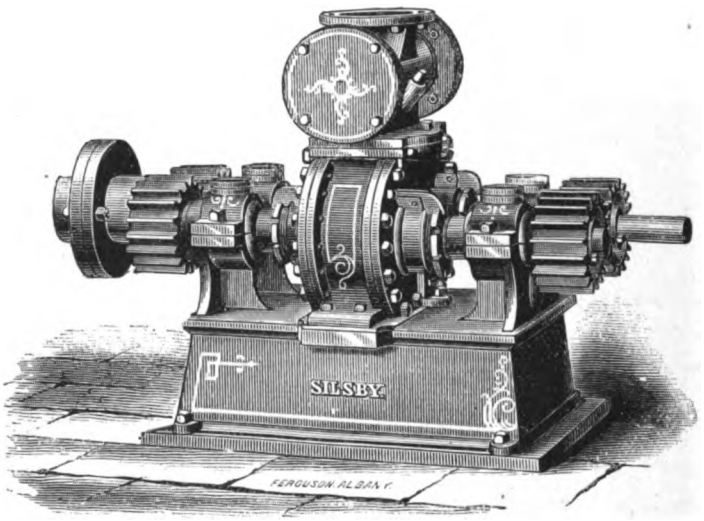

FIG. 340.

The above cut represents our Nos. 4, 5, 6, and 7 Power Pumps. They are built of extra strength, on square frames, double geared, with steel mandrels, and are furnished with a coupling which can be attached to either end of the pump, although when specially ordered they will be made to be run by gears or clutch.

Pumps Nos. 4 and 5 can be constructed to be run by belt, if required and are so ordered. Ordinary size of pulleys: For No. 4 pump, 20 inches in diameter by 7-inch faces; for No. 5 pump, 24 by 7 inches.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Length, Inches.	Diameter of Suction, Inches.	Diameter of Disch'ge, Inches.	Horse Power.	Prices.	
											Iron.	Br'nze.
No. 4	1¼	110	137	20½×31½	14¼	30	50	4½	4½	5.2	$230	$430
No. 5	2	100	200	21¼×35½	16⅝	33¾	60	6	5	7.6	300	560
No. 5½	3⅞	95	368	21¼×35½	18¼	38	54	8	6	13.9	430	700
No. 6	5½	90	495	25½×40½	19⅝	44¼	70	8	8	19	575	1150
No. 7	7⅓	80	587	25½×40½	20¼	46⅜	70	9	9	22.3	650	1250

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FIRE PUMP.

ADAPTED TO BE RUN BY BELT.

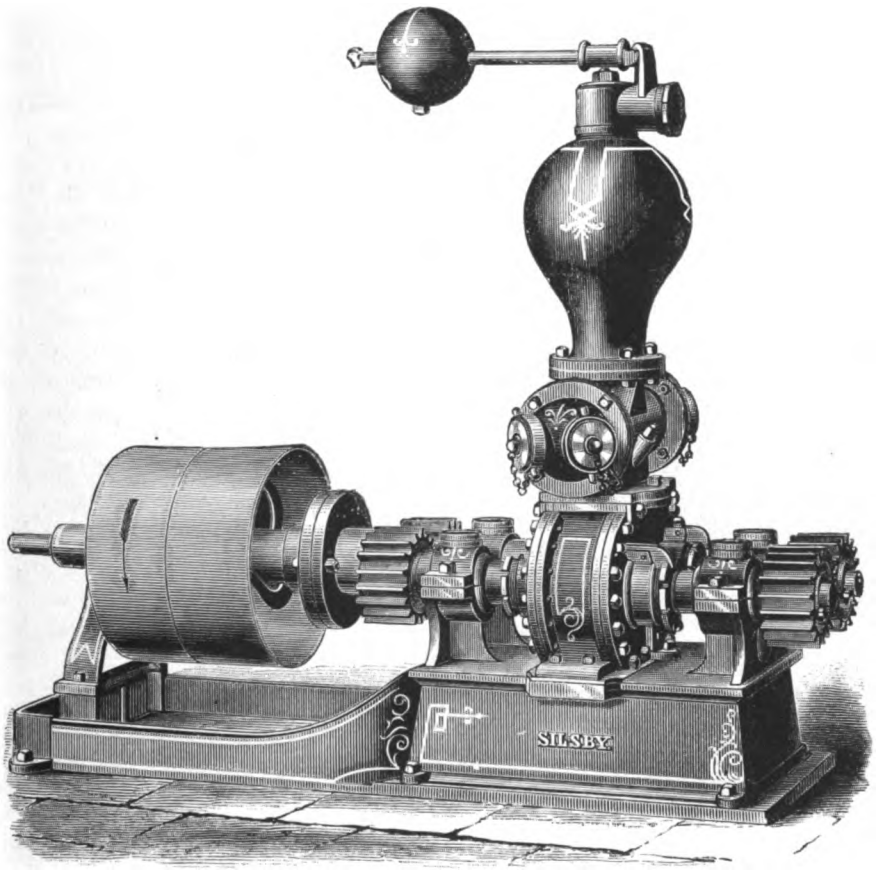

FIG. 350.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Length, Inches.	Diameter of Suction and Disch'ge, Inches.	Size of Pulleys, Inches.	Horse Power.	Prices.	
											Iron.	Br'nze.
No.2	$\frac{1}{5}$	550	110	$11\frac{1}{2}\times48$	$8\frac{7}{8}$	33	56	$2\frac{1}{2}$	12 × 7	8.25	$150	$215
No.$2\frac{1}{2}$	$\frac{1}{2}$	500	250	$12\frac{1}{8}\times58\frac{1}{2}$	$10\frac{1}{4}$	38	67	$3\frac{1}{4}$	$15\frac{1}{2}\times10$	18.75	205	305
No.3	$\frac{5}{6}$	400	333	18 ×64	$13\frac{5}{8}$	53	72	4	20 ×12	25	270	470
No.4	$1\frac{1}{4}$	350	437	$20\frac{1}{8}$ $74\frac{1}{2}$	$14\frac{3}{8}$	$55\frac{1}{2}$	83	$4\frac{1}{2}$	20 ×14	32.77	310	510

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FIRE PUMP.

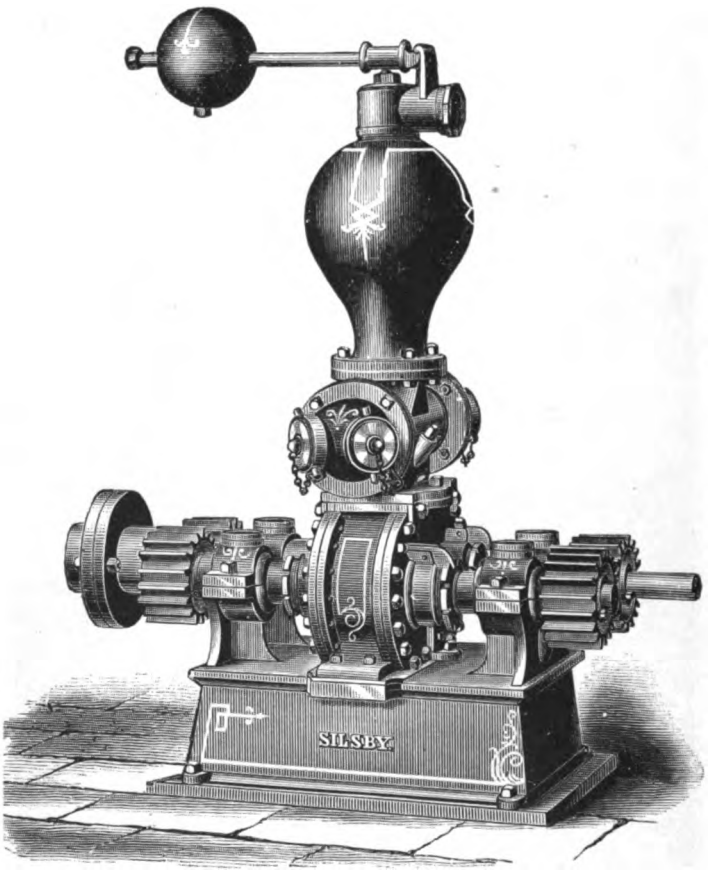

FIG. 360.

The above cut represents our celebrated Rotary Fire Pump, which, having been before the public for the last 39 years, and during that time having been thoroughly tested and tried in thousands of mills, factories, and manufacturing establishments generally, we think we may justly claim it to be the most reliable, efficient, durable, and economical fire pump yet introduced.

Unlike the ordinary fire pump, so extensively advertised by pump makers, these pumps are manufactured by us expressly for fire protection, and in their construction has been brought to bear our extensive experience in the manufacture of fire apparatus. The value of this will, we think, be apparent, when we state that we have for the past 37 years been engaged in the manufacture of the Silsby Rotary

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Steam Fire Engine, during which time we have built above 1,000 of these machines, a large number of which are now in active and successful operation in hundreds of towns and villages, and in most of our largest and best fire departments. Our experience has taught us what is necessary in a good and reliable fire pump, and we have spared no pains or expense in improving our pumps and constructing them in all their details for the work required of them. These pumps are made of the same selected materials, and with the same care and precision, as are employed in building our portable steam fire engines.

We build these fire pumps in eight different sizes, and adapt them to any required work, according to the power available to run them. In addition to their throwing from one to seven effective fire streams simultaneously, all stories of a building can be instantly flooded by means of a pipe from the pump and "cut-offs" for hose on each floor, or the pump can be connected directly with an automatic-sprinkler system. Water can be forced into elevated tanks and thence be thrown in fire streams by gravitation, or water can be forced direct from the pump through pipes and thrown on a fire from hydrants. It is impossible to enumerate the many ways in which these pumps can be adapted to afford efficient fire protection; we will, however, send full specifications and particulars of the best mode of fire protection for any city, village, mill, factory, manufacturing establishment, or other property if the owners will communicate with us.

Our medium size fire pump will force a stream from 200 to 250 feet from the nozzle, or four streams at once 150 feet each.

These pumps will draft water from 25 to 28 feet perpendicularly, and will pick up the water at once without priming.

These pumps are strongly built on a square frame, are double geared, with extra heavy steel mandrels, and are furnished with a coupling, although they will be fitted to be run by gears or clutch if specially ordered.

Size.	Capacity Each Revolution, Gallons.	Number of Revolutions.	Capacity per Minute, Gallons.	Size of Base, Inches.	Height from Bottom of Base to Center of Shaft, Inches.	Total Height, Inches.	Length, Inches.	Diameter of Suction and Disch'ge, Inches.	Number of Streams.	Horse Power.	Price.
No. 2	$\frac{1}{5}$	550	110	$11\frac{5}{8}\times20\frac{1}{2}$	$8\frac{7}{8}$	$33\frac{1}{2}$	$34\frac{1}{2}$	$2\frac{1}{2}$	1	8.25	$130
No. $2\frac{1}{2}$	$\frac{1}{2}$	500	250	$12\frac{1}{8}\times25\frac{1}{8}$	$10\frac{3}{8}$	38	41	$3\frac{1}{4}$	2	18.75	160
No. 3	$\frac{5}{8}$	400	333	$18\frac{1}{8}\times26\frac{1}{4}$	$13\frac{5}{8}$	53	$44\frac{1}{2}$	4	3	25	225
No. 4	$1\frac{1}{4}$	350	437	$20\frac{1}{8}\times31\frac{1}{2}$	$14\frac{3}{8}$	$55\frac{1}{2}$	$50\frac{1}{2}$	$4\frac{1}{2}$	4	32.77	260
No. 5	2	300	600	$21\frac{1}{4}\times35\frac{1}{2}$	$16\frac{5}{8}$	60	60	6	4	45	360
*No. $5\frac{1}{2}$	$3\frac{7}{8}$	260	1,007	$21\frac{1}{4}\times35\frac{1}{2}$	$18\frac{1}{4}$	$64\frac{1}{4}$	54	—	5	73.4	500
No. 6	$5\frac{1}{2}$	225	1,237	$25\frac{1}{2}\times40\frac{1}{2}$	$19\frac{1}{2}$	82	70	8	6	92.78	650
No. 7	$7\frac{1}{3}$	200	1,466	$25\frac{1}{2}\times40\frac{1}{2}$	$20\frac{1}{4}$	87	70	9	7	110	725

*This pump (No. $5\frac{1}{2}$) has been specially designed in conformity with the requirements of the Associated Mutual Fire Insurance Companies, and is what is known as THE UNDERWRITER'S PUMP. It has 8 inch suction and 6 inch discharge.

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FRICTIONAL GEARING.

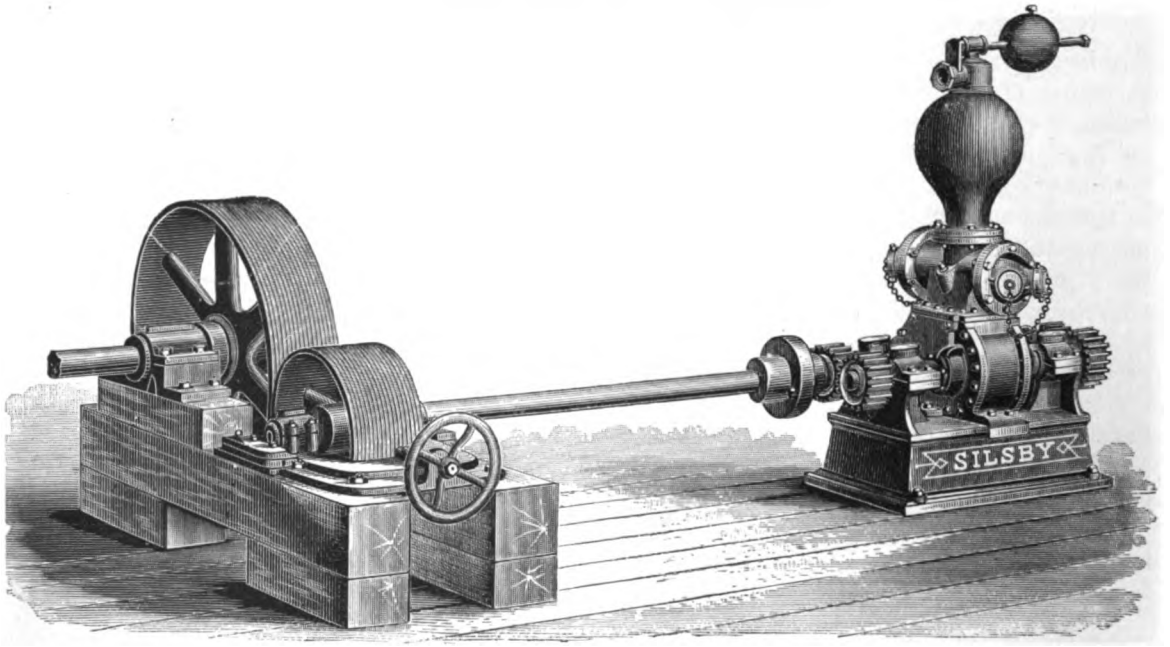

FIG. 361.

The above cut shows one of our fire pumps fitted with frictional gearing. With this attachment the pump can be started without shock or jar while the wheel or other machinery is running at full speed. The driving and receiving pulleys or gears have V-shaped grooves upon their outer surfaces, which are carefully turned and fitted to each other. By turning the hand-wheel, by means of a screw, the movable bed-plate with the receiving-pulley is forced ahead, bringing the grooved surfaces together and starting the receiving pulley with a very easy motion.

Prices, which will be quoted on application, depend on size of pump, the speed at which it is to be run, and the size and speed of the main shaft.

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STEAM FIRE PUMP.

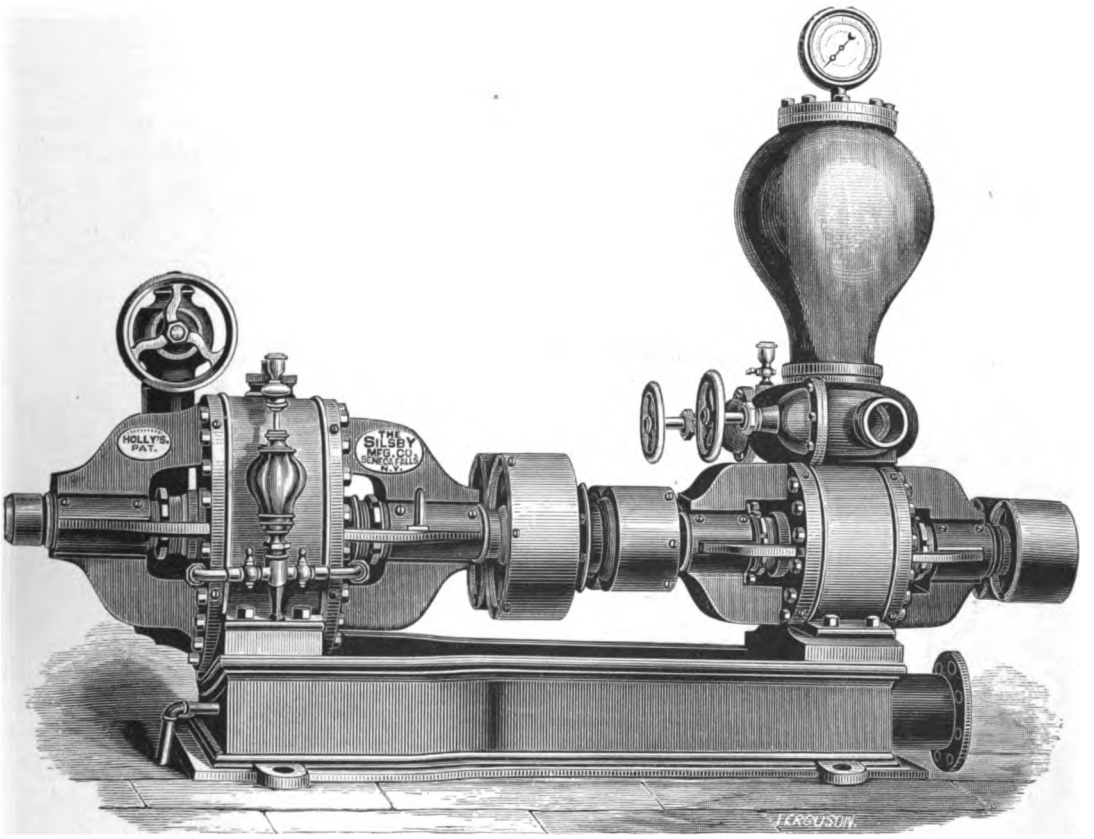

FIG. 370.

The cylinder and pump on this machine are built precisely like those on the Silsby Steam Fire Engines, as elsewhere described in this catalogue, and are made of the same materials and by the same skilled workmen.

These steam fire pumps are now so well known, and in such general use, that it is unnecessary for us to say much as to their merits. They are particularly recommended for mills, factories, public buildings, fire boats, etc.; and where steam is used they are certainly the most durable, economical, and reliable fire pump yet introduced, in the same manner as our rotary fire pumps attached to power.

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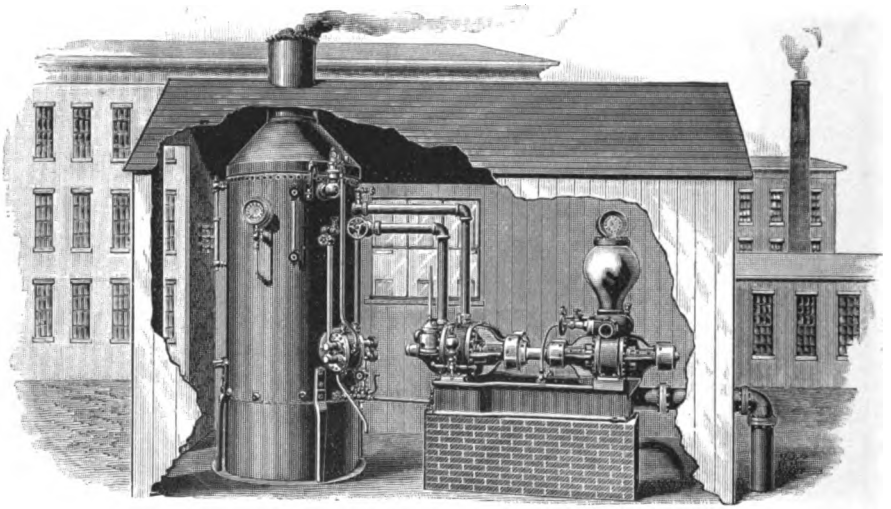
Our Steam Fire Pump is built on an iron frame, and is furnished with air-chamber, water-pressure gauge, steam and waste cocks, brass oil pump for steam cylinder, brass oil cups, packing stuffer, wrenches, and with outlets and gates for from two to four streams, complete, and all ready to attach hose, suction, and steam pipes. The discharge or outlets can be adapted for forcing the water through either pipe or hose, in any way that may be desired.

Size.	Capacity per Minute.	Size of Base.	Length.	Width.	Height.	Suction.	Price.
No. 0	1,100 gallons	32×28 in.	42 in.	28 in.	54 in.	5 in.	$900
No. 1	950 gallons	32×28 in.	42 in.	28 in.	54 in.	4½ in.	850
No. 2	800 gallons	32×28 in.	40 in.	28 in.	50 in.	4½ in.	800
No. 3	700 gallons	32×24 in.	40 in.	24 in.	46 in.	4 in.	750
No. 4	600 gallons	32×24 in.	40 in.	24 in.	46 in.	4 in.	700



We manufacture also stationary steam fire engines, complete with boiler, so that they can be used in mills, public buildings, etc., independently of the power and main machinery. Such apparatus is frequently placed in a fire-proof engine house separated from the main buildings, where it affords the most efficient fire protection in cases where there are a number of buildings to be protected, or where it is necessary to cover an extended area, as in our large lumbering establishments. This apparatus can be arranged not only to force one or more streams through hose, but also through piping laid for the purpose, with hydrants in suitable positions, thus reaching any point instantaneously. We can build this apparatus to order, of either the piston or rotary type, with capacities ranging from 500 to 9,000 gallons per minute. Estimates, specifications, and prices sent on application.

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STEAM WRECKING PUMP.

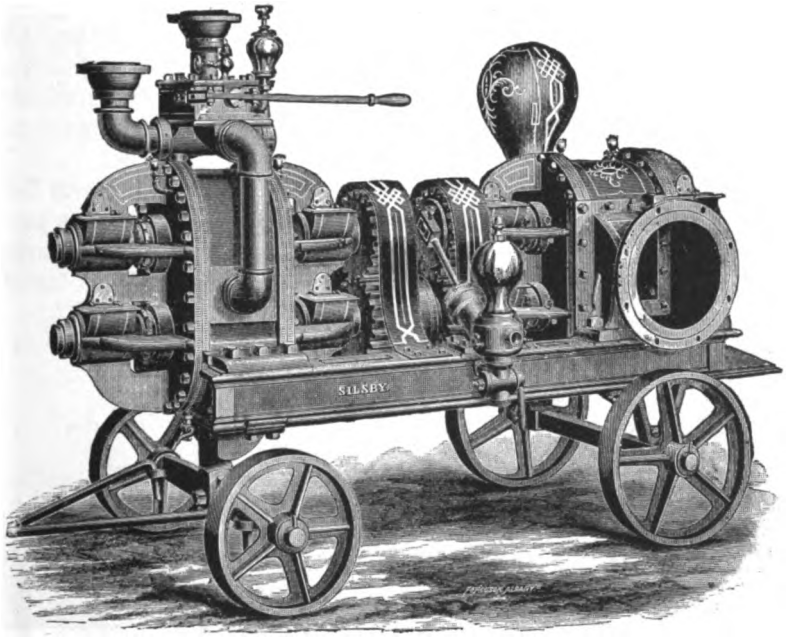

FIG. 380.

These pumps have been in successful operation on the waters of the United States and Canada for many years, and the numerous flattering testimonials we have received, and—what is more to the purpose—the number of orders we have had for them, warrant us in saying that they have given universal satisfaction.

While they will perform all the work that can be accomplished by any piston pump used for wrecking purposes, they will in addition do work that other pumps fail to do, as, having no valves to become obstructed, they are not liable to get out of order, or to fail to work at some critical moment. They will not clog with wet grain or other substances, and we have been assured by persons of undoubted reputation and high standing in the business that they have frequently saved wrecks with one of our pumps that would have had to be abandoned had any other style of pump been their sole reliance.

With the many improvements we have effected in these pumps, we have no hesitation in claiming that they are the most powerful, economical, and reliable apparatus for pumping immense volumes of water from wrecks, coffer-dams, locks, dry-docks, etc., etc., and it is with the utmost confidence in their ability to perform all we claim that we offer our improved wrecking pump to the public.

We now build these pumps in such a manner that not only is the space required to operate them in reduced to a minimum, but they are arranged so as to be placed

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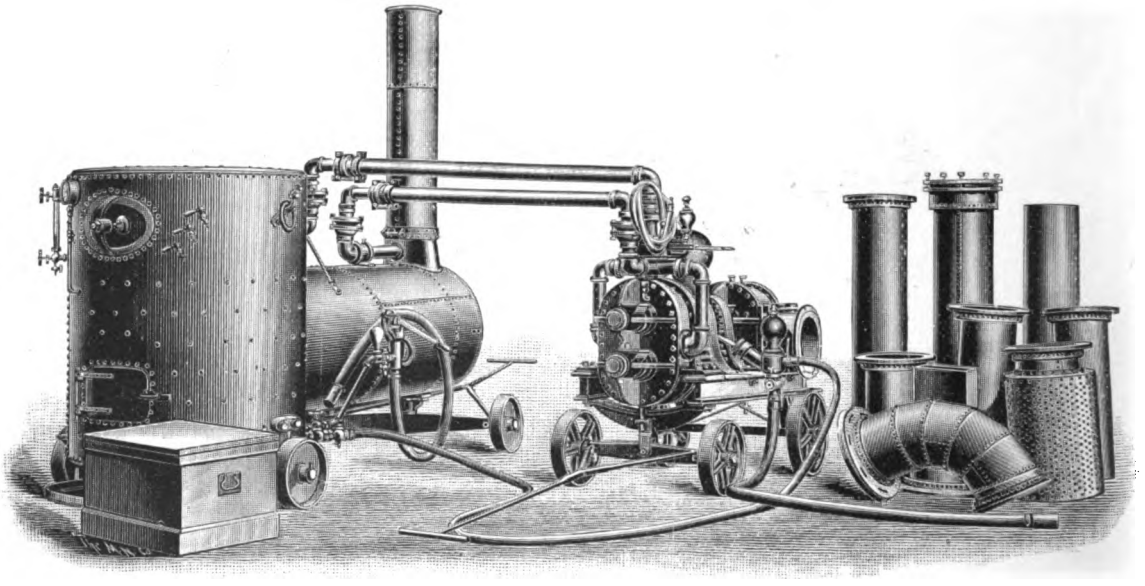
in almost any position, advantages that will be readily understood and appreciated by those practically acquainted with the wrecking business.

The engine and pump are on an iron truck, the front wheels of which run under, so that it may be turned in its own length. We furnish these pumps either with or without boiler. The boiler is also on wheels, the front ones turning under, so that it may be turned in its own length, the same as the engine and pump. The boiler is made of the very best materials, by experienced boiler-makers, and is a combination of the horizontal and vertical boilers, made and adapted especially for our improved wrecker.

The cylinder and pump work both ways, so that the suction can be used as the discharge, or *vice versa*, according to the position in which it may be necessary to place the apparatus. The engine and pump can also be instantly reversed to remove any obstruction in the suction pipe, or which may have accumulated around the strainer, and can be started again at once without priming.



We furnish these pumps, complete for running, with steam gauges, glass tube water gauge, brass oil cups, oil pump for steam cylinder, steam and blow cocks, try cock, safety-valve, sliding steam and exhaust pipes, with ball joints; thaw hose, hand and power boiler feed-pump, with suction and delivery hose for same; packing-box stuffer and wrench, starting or oiling bar, wrought-iron suction, with slip joint, including strainer and timber length, with bolts and packing for same; smoke-stack, jointed; grates, water pan to place under fire when on deck, etc., etc. We also furnish tool chest, with lantern, poker, shovel, screw wrench, hammer, oil can, etc.

The diameter of the suction and discharge is 12 inches, and the pump has a capacity of 2,500 gallons of water per minute.

Prices, with or without boiler, may be had on application.

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PISTON POWER PUMP.

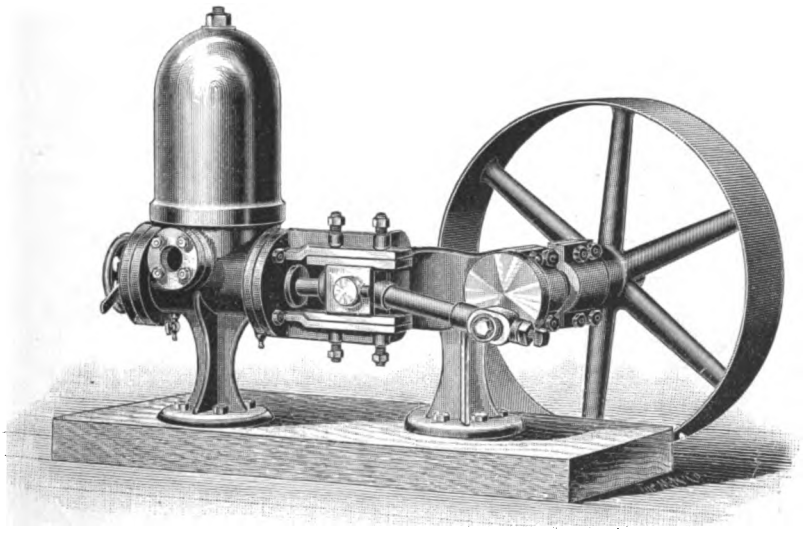

FIG. 390.

We are manufacturing at present four sizes of Double-Acting Plunger Power Pumps, for hot or cold liquids, boiler feeders, tank supply, reliability under heavy pressure, fire protection, and general mill and factory purposes.

All the frictional surfaces are unusually large, thus preventing heating or cutting under the heaviest pressure. The shaft, crank-pins, and cross-head pins are of Bessemer steel. The shaft boxes are "Babbitted," and the connecting-rod has composition boxes. The ways or slides are composition lined; the plunger rod and plunger are of bronze. All the bearings and the plunger packing can be set up while the pump is in operation.

The valves can be reached by the removal of one nut. They have both vacuum and air chambers.

The connections and air-chamber are so arranged that suction may be taken from either side; and the pumps are made right or left hand, as ordered.

Any part of these Pumps can be duplicated at short notice.

Size and Stroke of Pump, Inches.	Size of Suction and Discharge, Inches.		Diameter and Face of Pulley, Inches.		Quantity Each Revolution, Gallons.	Revolutions per Minute for Boilers.	Maximum of Boilers it will supply, H. P.	Horse Power Required.	Revolutions per Minute, Fire Service.	Size of Fire Stream, Inches.	Distance Steadily Sustained, Feet.	Height of Stream in a Calm, Feet.	Price of Pump with Pulley.
3½×3½	1½	1¼	24	6	.29	50	100	.84	100 to 150	⅝	125	100	$150
4 ×4	2	1¾	30	8	.43	40	125	1	100 to 150	¾	150	120	170
4 ×6	2½	2	36	9	.65	40	200	1.5	100 to 150	⅞	150	120	220

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PISTON POWER PUMP.

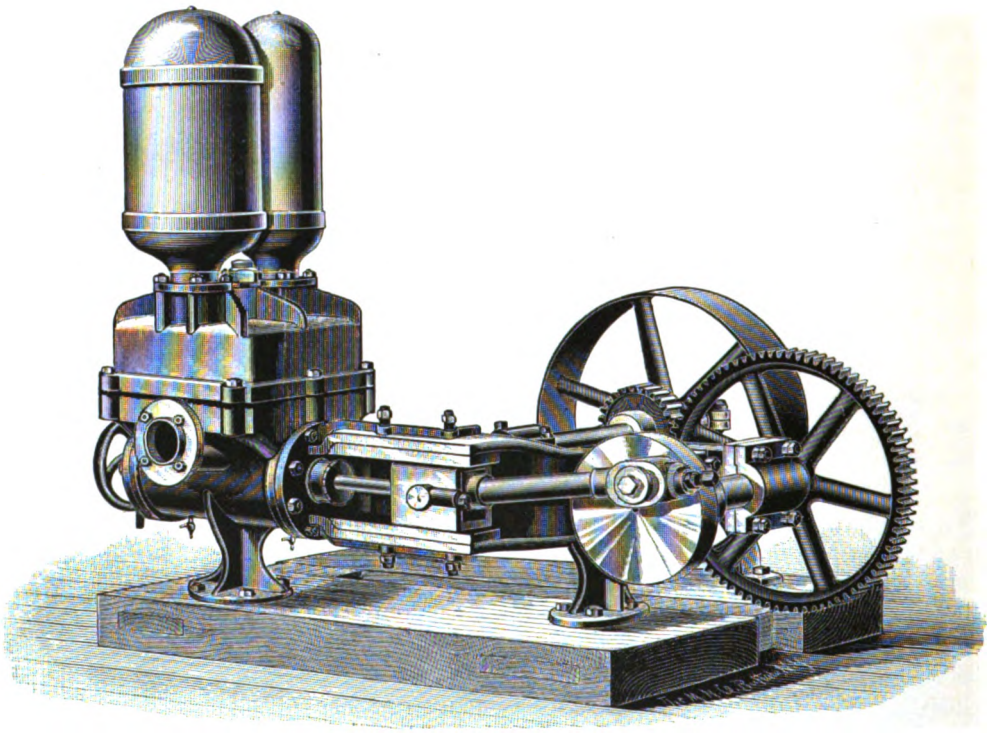

FIG. 391.

This pump is similar to those described on the preceding page, but is powerfully geared, and is of greater capacity, being 6 x 6 inches, and having 3-inch suction and 2½-inch discharge. The pulley is 36 inches in diameter with 10-inch face. The pump discharges 1.45 gallons each revolution. It can be run from 40 to 60 revolutions per minute for feeding boilers, and will supply from 450 to 600 H. P., requiring for the former 3 and for the latter 4 H. P. For fire service the speed may be increased to from 100 to 150 revolutions, when the pump will force two ¾-inch streams to a distance of 125 feet, or 100 feet perpendicularly. The price is $300.

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THE SILSBY HEATER FOR STEAM FIRE ENGINES.

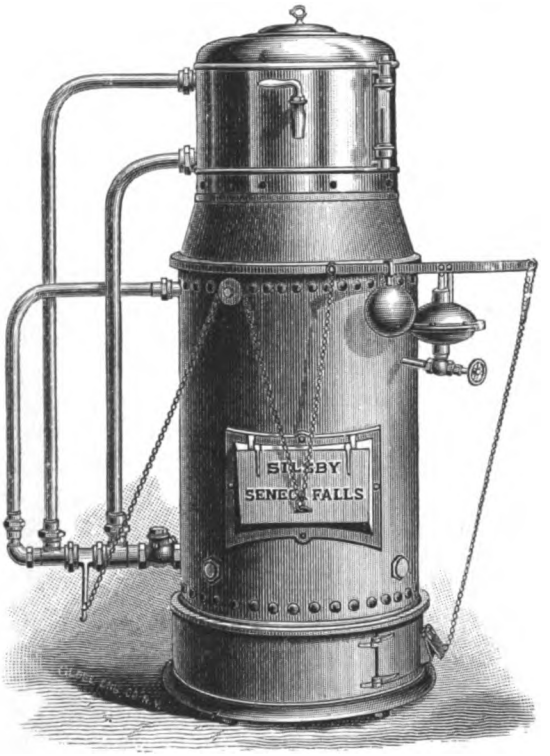

FIG. 400.

No engine house where a steamer is located is properly equipped unless supplied with a heater. It being absolutely necessary to keep the engine room constantly warm in cold weather, to guard against frost, some sort of heating apparatus is required, and our heater accomplishes this without the aid of any other appliance, and with no greater consumption of fuel than would be used in an ordinary coal stove. When to this is added the immense advantage of having the water in the boiler at all times hot, enabling the machine to be put in operation as quickly as the hose can be laid—no matter how short the run—the value of fire engine heaters will at once be apparent; and it is this consideration which has brought them into such general use. Furthermore, there is no question that the use of a suitable heater preserves the boiler, and consequently prolongs its lifetime, thereby increasing the efficiency and durability of the machine.

The Silsby Heater can be attached to any steam fire engine, and is already in successful operation in connection with every well-known make of steam fire engines, both of American and English manufacture; and it is a significant fact that,

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although there are now several hundreds of these heaters in use, we have yet to hear the first word of complaint with regard to any one of them.

This heater is constructed of the best materials and in a thoroughly workmanlike manner throughout. The shell and fire-box are made of steel by our own skilled boiler makers; the water tank is sheet copper, and every part is made with a view to the greatest durability and efficiency. Each heater is set up and tested before leaving our factory.

The Silsby Heater is absolutely automatic in all respects. Coal or coke is supplied to the fire through a self-feeding magazine, but the heater will be adapted for burning natural gas when desired. The diaphragm damper regulator keeps the temperature steady and uniform, and can be adjusted so as to maintain any desired pressure from boiling point up to 25 or 50 pounds of steam. The forward movement of the engine immediately closes the valves in the pipes attached to the engine, changes the current of circulation of the water from the engine to the tank on the heater, and opens the damper on the heater, when the action of the regulator will at once close the draft.

The heater requires but little attention, it not being necessary in the coldest weather to look after it oftener than once in every twelve hours, or twice a day, and then only to shake down the grate and put in a scuttle of coal. It is very economical in the use of fuel, burning no more coal than such a stove as would be needed, in the absence of the heater, to keep the engine room sufficiently warm in winter. With this heater the use of any other heating apparatus may be dispensed with, as far as the engine room is concerned.

The Silsby Heater can be placed on the same floor with the engine, and thus possesses a decided advantage over most other heaters, which will not circulate the water freely unless located in the basement.

This style of heater is made in two sizes, and supplied with all the necessary appurtenances, including not only the pipes and cocks that go on the engine, but also the slip-joints, automatic stop-valves, braces, cocks, safety valve, water gauge, and everything else needed to attach the heater and put it in operation, and is accompanied by full and clear directions for setting and running it.

Finally, the Silsby Heater is the most simple, reliable, durable, and economical, as well as the most complete, of any in use, and stands without an equal. Every heater is warranted to be precisely as represented and to perform its work satisfactorily.

Price includes boxing and delivery on cars at Seneca Falls.

Size.	Capacity.	Diameter of Boiler.	Height Over All.	Width Over All.	Price.
No. 1	25 lbs. steam	20 inches	4 feet 8 inches	3 feet	$200
No. 2	50 lbs. steam	22 inches	4 feet 10 inches	3 feet 2 inches	250

In ordering, state whether heater is to be placed on same floor with engine or in the basement.

A special catalogue of Heaters for fire engines and engine houses, containing numerous testimonials, will be sent to any address on application.

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DOUBLE SILSBY HEATER.

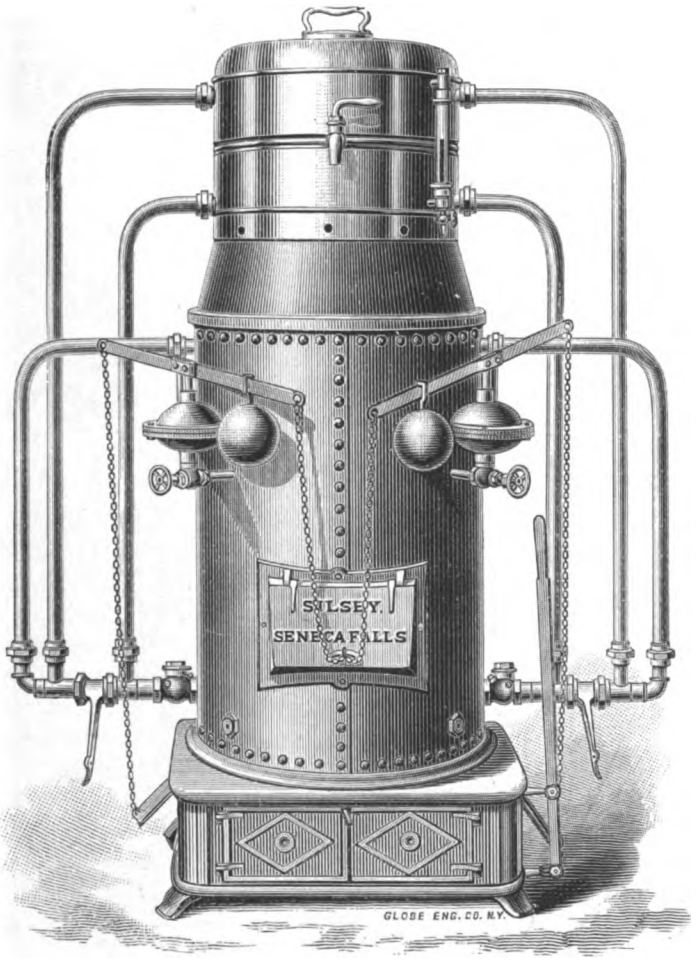

FIG. 410.

This heater is constructed on the same principle as the Silsby Heater, but is adapted for two steam fire engines when kept in the same house. It has all the advantages of the Silsby Heater, which are fully set forth elsewhere, and is, to describe it briefly, two such heaters united into one and operated by one fire. It will warm the engine room, but will not heat the entire building. Each heater is supplied with all pipes, cocks, and automatic connections needed to attach it to both engines, and is securely boxed for shipment. Directions for setting up the heater and operating it are sent with each one, and satisfaction is always guaranteed.

Size.	Size of Base.	Diam. of Boiler.	Height Over All.	Width Over All.	Price.
No. 5	2 feet 3 inches square	22 inches	4 feet 10 inches	4 feet 6 inches	$325

In ordering, state whether heater is to be placed on same floor with engines or in basement.

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COMBINED ENGINE AND HOUSE HEATER.

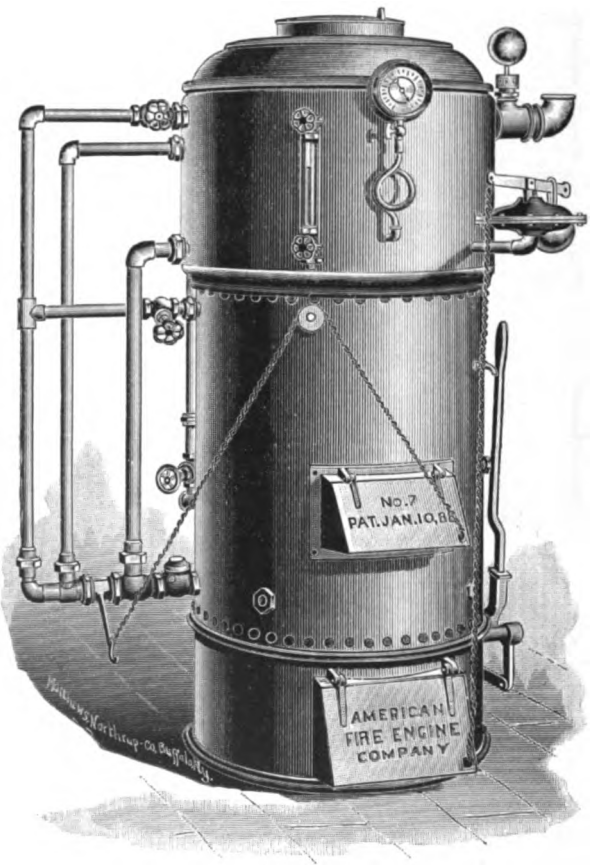

FIG. 420.

This heater is made on an entirely new principle, and its construction is peculiar and novel, it being the first and only one of the kind ever produced. It is, in effect, two independent heaters combined in one, one heater being used for keeping hot the water in the boiler of a steam fire engine, and the other for warming the building *by means of steam heat*, although the system of heating by means of hot water can be used, if preferred, with equally good results. The economy and convenience

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of this combination will be apparent. There is but one fire to look after, and great saving in fuel over the usual methods of warming such buildings, to say nothing of the advantages of heating with steam.

With regard to its qualities as an engine-house heater, we may say that we are now engaged extensively in the manufacture of various styles and sizes of heaters embodying the same general principle and adapted for heating buildings of every description. As an engine heater it possesses every desirable quality.

It is made of the very best materials and in the most workmanlike manner throughout. The shell and fire-box are of steel, and in each and every detail no pains or expense has been spared to make the apparatus of such construction as to insure the greatest efficiency, reliability, and durability.

It can be attached to any steam fire engine, and it can be placed on the same floor with the engine or in the basement.

It is automatic in every respect, having magazine feed for supplying the fire-box with fuel and a diaphragm regulator. Any desired pressure can be maintained in the engine boiler from boiling point up to 25 or 30 pounds of steam.

The heater does not need attention oftener than once or twice in twenty-four hours. There is a rocking grate operated by means of a lever from the outside.

In warm weather, when the radiators are not in use, both parts of the heater can be turned together, thus utilizing all the heating surface for keeping steam in the engine boiler and running the heater with the minimum consumption of fuel.

The heater is furnished with everything needed to connect it with the engine and put it in operation, including nickel-plated pipes and cocks to go on the engine boiler, slip-joints, stop-valves, etc., etc., but we do not supply radiators and piping for warming the building. Radiators may be placed wherever needed, but this work should be intrusted to a competent steam fitter.

Each heater is carefully tested before leaving our works and is securely boxed for shipment. Full and plain directions are sent with every one, both for setting up and operating it, the latter being of form suitable for framing and hanging in engine house.

The heater has capacity for supplying 300 square feet of direct radiating surface.

A large number of these heaters is now in successful operation, and we have no hesitation in guaranteeing complete satisfaction in every instance.

Size.	Diameter of Base.	Diameter of Boiler.	Height Over All.	Width Over All.	Price.
No. 7	2 feet 2 inches	24 inches	5 feet	3 feet 6 inches	$350

In ordering, state whether heater is to be placed on same floor with engine or in the basement.

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COMBINED ENGINE AND HOUSE HEATER.

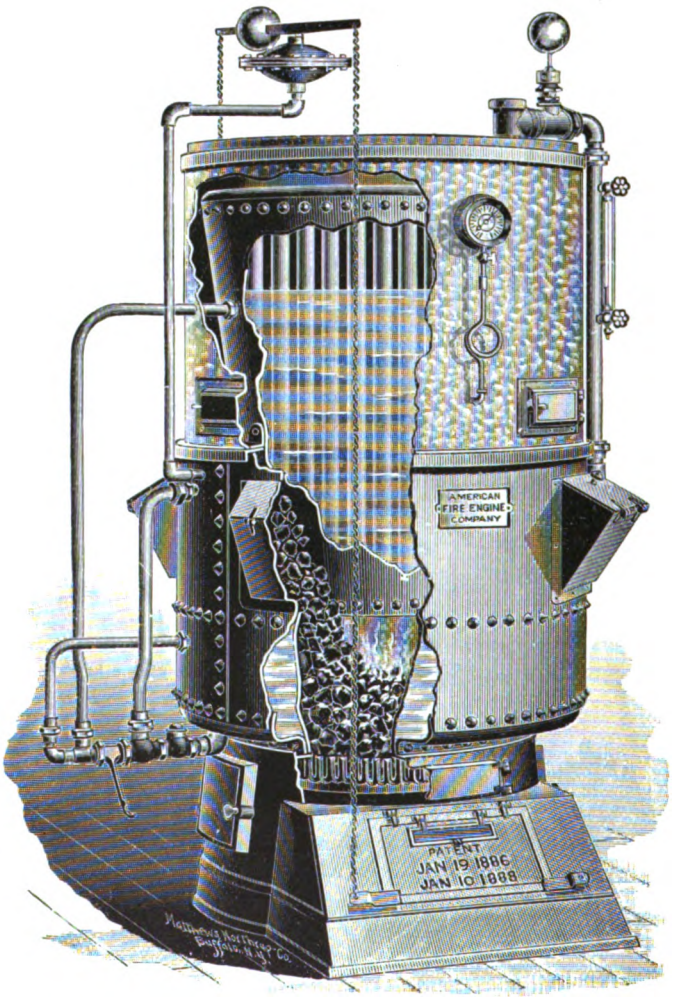

FIG. 430.

For unusually large engine houses, or such as require more radiating surface than our Fig. 420 is capable of supplying, we beg to offer the form of double side-feed boiler shown in the above engraving. With the various sizes here catalogued

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there is no engine house in which our system may not be adopted with assurance of the most satisfactory results.

In cases where two engines are located in one house, the heater can be made to keep steam in the boilers of both engines, at a trifling additional expense.

This heater should always be placed in the basement.

Price includes automatic damper regulator, steam gauge, safety valve, water column, glass water gauge, and all pipes, valves, and fittings necessary to connect the heater to the engine, together with our automatic trip-valves, slip-joints, etc., also boxing and delivery on cars at Seneca Falls.

SIZE.	No. 7½	No. 8	No. 8½	No. 9	No. 9½
Diameter of boiler shell, inches,	35	41	43	51	54
Height of boiler shell, inches,	37	37	45	45	45
Diameter outside of jacket, inches,	38	45	46	55	57
Total height of boiler without trim'gs, inches,	71	73	81	84	84
Diameter of fire-pot, inches,	24	30	32	38	40
Diameter of the two steam outlets, inches,	2	2½	2½	3	3
Diameter of return pipe, inches,	1¼	1½	1½	2	2
Diameter of smoke-flue, inches,	8	10	10	12	12
Number of square feet of direct radiating surface it will supply,	600	800	1,000	1,400	1,800
Price, complete,	$450	$525	$600	$800	$900

NOTE.— For direct radiation, each square foot of radiating surface will heat from 50 to 100 cubic feet of space, and for indirect radiation from 25 to 50 cubic feet, dependent on the conditions as to character of building, exposure, etc.

We recommend the use of chestnut or stove size of coal in Nos. 1 to 7, small egg size in Nos. 7½ and 8, and large egg or small furnace in Nos. 8½, 9, and 9½.

NOTICE.— All persons are cautioned against making or using, unless duly authorized by us, a combined engine and house heater of any description, or of adapting any form of heater so as to be used for the double purpose of keeping steam in the boiler of a fire engine and warming the building, as every such device is subject to patents owned by this company. *These patents cover any apparatus for accomplishing these two purposes by means of one fire.*

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STEAM HEATERS FOR WARMING BUILDINGS.

Since the superiority of steam for heating purposes has come to be universally acknowledged, there has been an increasing demand for simple and reliable generators suitable for dwelling-houses and other small and medium size buildings, boilers that would be "portable" (not requiring any brick work), that would be moderate in cost, easy to care for and manage, and absolutely safe. With the utmost assurance that these requirements have been met by us, we beg to offer to the public the several styles of low-pressure steam heaters illustrated and described on the following pages.

There are two classes of steam heaters in the market, namely: cast-iron and wrought-iron or mild steel, manufacturers as a rule confining themselves to one or the other form of construction. Those that make cast-iron boilers naturally claim they are better for house heating than those made from wrought-iron or steel, while the makers of the latter class of boilers are equally earnest in their claims that the material used by them is most suitable for the purpose. Both are right in some respects, as each metal possesses strong points in its favor, and we have utilized the good qualities of both in the construction of our boilers. Having abundant facilities for making both kinds, we manufacture steel and cast-iron boilers; and without advocating the claims of one over the other (for both are excellent and have been received with great favor, giving most satisfactory results in actual use), we present the details of construction in both, with the peculiar advantages of each. No one will have occasion to regret the selection of either style, for economy, reliability, or durability.

Each of our heaters is furnished complete with steam and water gauges, try-cocks, safety-valve, etc., and is accompanied by full directions for setting up and operating.

The following, briefly stated, are some of the advantages of our Steam Heaters:—

They are economical in the use of fuel.
They are cheap, as no brick work is required.
They are simple and easy to care for and manage.
They do not need to be frequently replenished with water.
They are the least trouble to keep clean.
They are reliable, and cannot get out of order.
There are no sections to crack, and no bolt holes to leak.
There are no flanges liable to break.
They are easily transported and set up.
They can be used as self feeders or surface burners.
They are thoroughly tested before leaving our factory.
They are made on scientific principles.
They are compact, durable, and absolutely safe.

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THE SILSBY STEEL BOILER.

FIG. 450.

This boiler is an invention of our own, and is constructed on the most approved principles. The great favor with which it has been received by the general public and its high endorsement by many steam heating experts, with the excellent results it has shown in actual use, warrant us in the assertion that it ranks among the best steam heating boilers now in the market.

This boiler is furnished either with or without asbestos covering, as may be preferred.

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The internal construction of the heater will be apparent from the accompanying illustration. Coal is fed to the fire-box through a central magazine, surrounding which are wrought-iron drums connected top and bottom with the water wall, having fire tubes extending their entire length. Thus there is constant and rapid circulation of the water, and a large area of effective heating surface.

LOOKING INTO FIRE-BOX.

STYLE OF BOILER,	With Covering, Fig. 450.			Without Covering, Fig. 460.		
NUMBER,	10	11	12	15	16	17
Diameter of boiler, inches,	24½	27½	30½	24½	27½	30½
Diameter of fire-pot, inches,	21¼	23¾	25¾	21¼	23¾	25¾
Number of circulating drums,	7	9	6	7	9	6
Diameter of circulating drums, inches,	5	5	7	5	5	7
Length of circulating drums, inches,	21	21	21	21	21	21
Number of tubes in drums,	28	36	30	28	36	30
Size of tubes in drums, inches,	1½	1½	2	1½	1½	2
Square feet of heating surface,	60	70	80	60	70	80
Square feet of radiating surface it will supply.	390	460	550	360	430	510
Size of steam outlet, inches,	1½	2	2½	1½	2	2½
Size of return inlet, inches,	1	1¼	1½	1	1¼	1½
Diameter of heater, including covering, inches,	27	30	33	—	—	—
Height of heater, inches,	61	61	61	61	61	61
Total height with trimmings, inches,	71	71	71	71	71	71
Size of smoke-flue, inches,	6	7	7	6	7	7
Weight, pounds,	1,015	1,220	1,440	1,000	1,200	1,420
Price, complete with trimmings,	$225	$250	$275	$200	$225	$250

The radiating surface each boiler is capable of supplying, as rated above, is based on the supposition that all steam and return pipes in the basement are to be properly covered.

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THE SILSBY STEEL BOILER.

FIG. 470.

The larger sizes of our steel boiler are made, as shown in the above illustration, with an outer jacket of galvanized iron lined with asbestos, which effectually prevents radiation of heat in the basement, and also enables the use of either direct or indirect draft.

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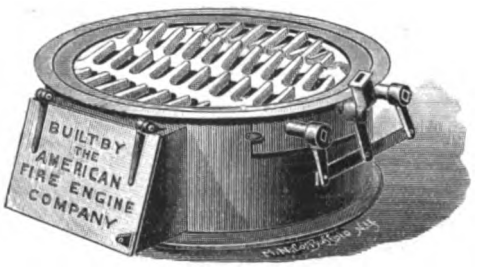
All our heaters are entirely automatic, requiring attention only once or twice in twenty-four hours, and then only to shake the grate and supply the magazine with coal. They are provided with a patent damper of our own invention, and a servant or child can care for and run the apparatus without difficulty.

Every heater made by us has an anti-clinker rocking grate, operated by means of a lever on the outside, with closed doors, so there is no escape of dust. It cleans the fire readily of both ashes and clinkers, and can be easily dumped when necessary.



NUMBER OF BOILER,	20	21
Diameter of boiler, inches,	33	36
Diameter of fire-pot, inches,	26	28
Number of circulating drums,	9	10
Diameter of circulating drums, inches,	6	6
Length of circulating drums, inches,	21	21
Number of tubes in drums,	36	40
Size of tubes in drums, inches,	1½	1½
Square feet of heating surface,	140	150
Square feet of radiating surface it will supply,	750	825
Size of steam outlets, inches,	2	2½
Size of return inlet, inches,	2	2
Diameter of heater, including jacket, inches,	38	41
Height of heater, inches,	64	64
Total height, with trimmings, inches,	68	68
Size of smoke-flue, inches,	8	8
Weight, pounds,	1,650	1,900
Price, complete with trimmings,	$350	$400

The radiating surface each boiler is capable of supplying, as rated above, is based on the supposition that all steam and return pipes in the basement are to be properly covered.

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THE COMFORT HEATER.

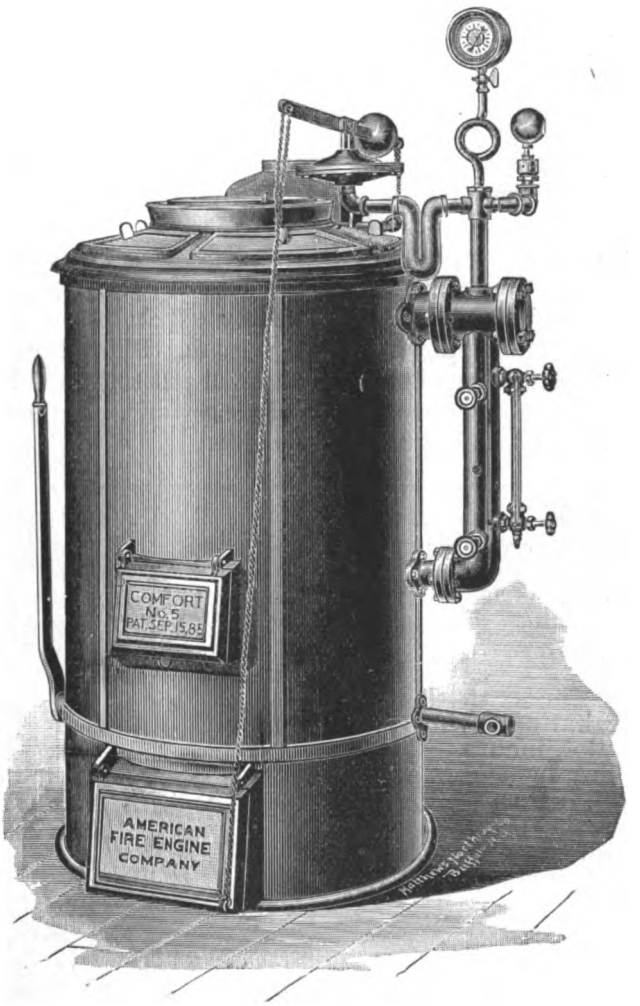

FIG. 440.

This heater is constructed almost wholly of cast-iron, and is designed mostly for use in dwelling-houses, as well as small and medium size buildings of every description. The working parts are few, large, and plain, but at the same time there is great effective heating surface.

In this heater there are no sections bolted together, and the heater is remarkably free from bolts of any sort, the only ones, in fact, being the short bolts used for

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attaching the boiler to the fire-pot, and connecting the water column. All of these are readily accessible, and are not, moreover, productive of leakage, as none of them are tapped into surfaces exposed to the water or steam, but all pass through flanges.

There are no rust joints whatever. The heater is very easily set up, and occupies but little space, and can be put into a cellar in sections through a small door or window.

No brick work is required. Although this is the case, *the heater will not warm the basement*, and fruit or vegetables may be kept in the cellar without injuring them. The draft is either direct or indirect, and can be quickly and easily changed from one to the other at will. The heater makes steam very rapidly, and consequently a great saving in fuel is effected. The fire-box, where the heat is most intense, is entirely surrounded by water, which communicates direct with that in the boiler by means of suitable "legs." The gases of combustion pass around all sides of the boiler and through wrought-iron flues that extend its entire length. The boiler is corrugated both inside and outside, affording a large area of heating surface in a small space, and the tubes are securely expanded at both ends. The steam dome is ample, and insures absolutely dry steam. Should repairs be needed at any time, the entire heater can be taken apart and put together again in two or three hours, and an inexperienced person can do the work. If necessary the heater can be readily disconnected and moved to one side.

NUMBER OF HEATER,	3	5	6
Diameter of fire-pot, inches,	19½	23	27
Diameter of boiler, inches,	24	28	33½
Length of boiler, inches,	24	24	24
Size of tubes, inches,	2	2	2
Number of tubes,	17	25	35
Square feet of heating surface,	48	60	77
Square feet of radiating surface it will supply,	280	350	450
Size of steam outlet, inches,	2½	3	3½
Size of return inlet, inches,	1¼	1½	2
Diameter of shell, inches,	26	30	37
Height of heater, inches,	54	54	54
Total height, with trimmings, inches,	68	68	68
Size of smoke-flue, inches,	7	7	7
Weight, pounds,	1,125	1,520	1,925
Price, complete with trimmings,	$150	$175	$215

The radiating surface each heater is capable of supplying, as rated above, is based on the supposition that all steam and return pipes in the basement are to be properly covered.

NOTE.—For direct radiation each square foot of radiating surface will heat from 50 to 100 cubic feet of space, and for indirect radiation 25 to 50 cubic feet, dependent on the conditions as to exposure, etc.

Our special catalogue of Steam Heaters for warming buildings, which contains more detailed descriptions, will be mailed to any one on request.

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FIRE DEPARTMENT SUPPLIES.

Polished Taper Brass Play Pipe, with Swivel Metal Handles.

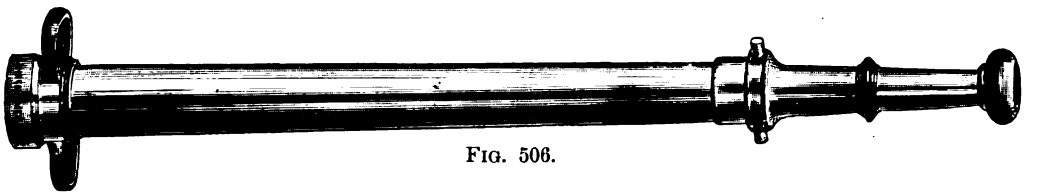

FIG. 506.

2 and 2½ inch butt, 26 inches long, without nozzle, $12.00; . nickel plated, $14.00
3½ inch butt, for 1¾, 2, or 2¼ inch nozzle, ... 15.00
4 and 4½ inch butt, for 3 or 4 inch nozzle, ... 20.00

Polished Straight Brass Play Pipe, with Leather Handles.

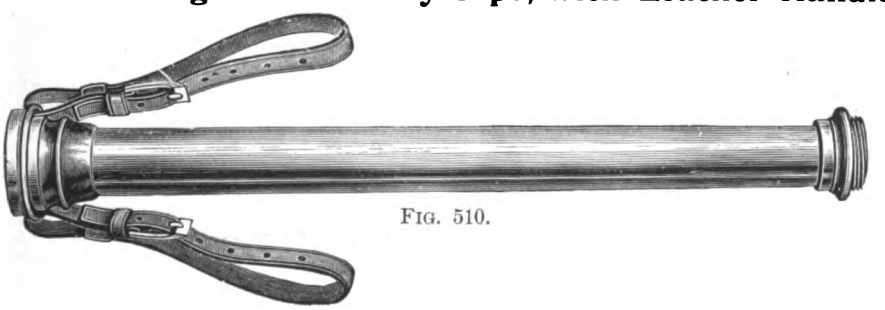

FIG. 510.

2 and 2½ inch butt, 20 inches long, ... $11.00; nickel plated, $13.00
2 and 2½ inch butt, 30 inches long, ... 12.00; nickel plated, 14.00

Twine Wound Play Pipe.

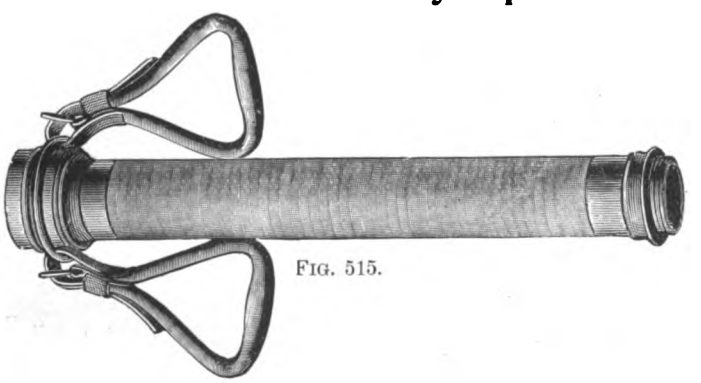

FIG. 515.

2 and 2½ inch butt, 20 inches long, painted, ... $12.00

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Leather Covered Play Pipe.

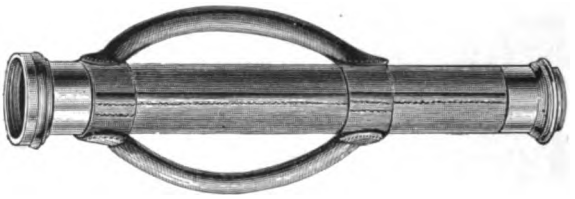

FIG. 520.

2 and 2½ inch butt, 20 inches long, with handles, ... $12.00

Gum Play Pipe.

FIG. 525.

2½ inch butt, 24 inches long, without nozzle, with handles, ... $15.00

Underwriters' Play Pipe.

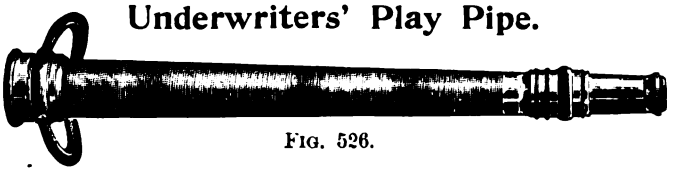

FIG. 526.

2½ in. butt, 30 in. long, wound and painted, with swivel handle and screw tip, $10.00

Patent Flexible Play Pipe.

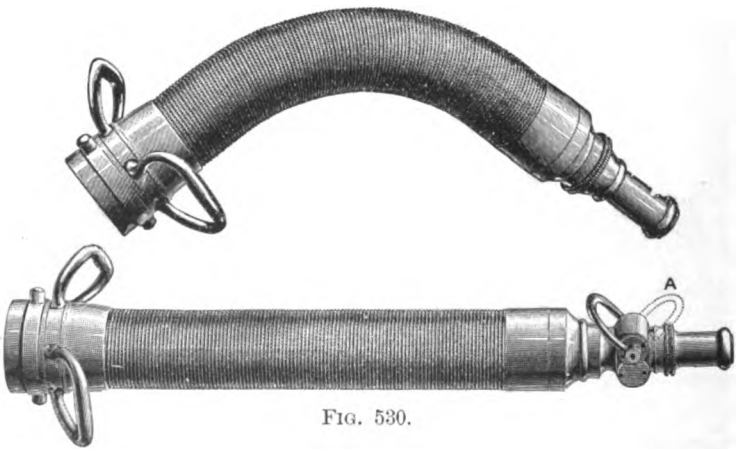

FIG. 530.

2½ inch butt, 30 inches long, rubber-lined cotton, wire wound, ... $15.00

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Bead Nozzle, with Removable Ring.

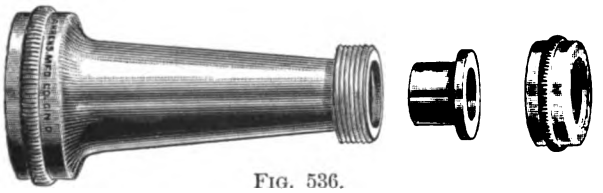

FIG. 536.

7 inches long, for heavy fire duty.

Sizes, ½, ⅝ inch, $3.50; ¾, 4.00; ⅞, 4.50; 1, 5.00; 1⅛, 5.50; 1¼, 6.00; 1⅜, 6.50; 1½, 7.00.

Smooth Bore Nozzle, with Gum Protecting Ring.

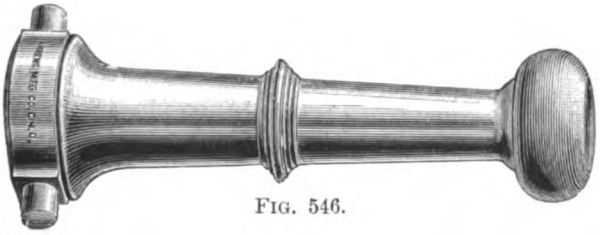

FIG. 546.

Sizes, ⅝ inch, $4.50; ¾, ⅞, 5.00; 1, 1 1/16, 5.50; 1⅛, 1 3/16, 6.00; 1¼, 1 5/16, 7.00; 1⅜, 8.00; 1½, 9.00; 1⅝, 1¾, 10.50; 2, 12.50; 2¼, 14.00; 2½, 15.00; 3, 16.00; 3½, 17.50; 4, 19.00.

Ring Nozzle.

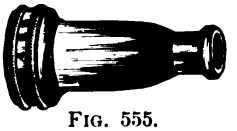

FIG. 555.

6 inches long, for heavy fire duty.

Sizes, ⅝ to 1½ inch, inclusive, ... polished brass, $3.00; nickel plated, $3.25

Smooth Bore Nozzle.

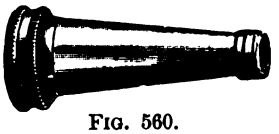

FIG. 560.

7 inches long, for heavy fire duty.

Sizes, ⅝ to 1½ inch, inclusive, polished brass, $3.00; nickel plated, 3.25.

Fitted with bushing ring, $4.00; extra rings, 75 cents each.

Spreading Nozzle.

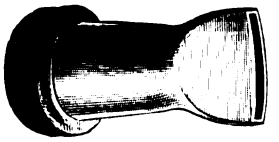

FIG. 575.

7 inches long, to use on lumber piles or shingles, and for oil fires.

With 1 inch spread, polished brass, $3.00; nickel plated, 3.25.

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Shut-off Nozzle.

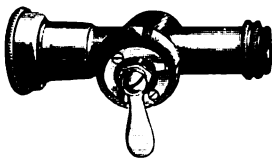

FIG. 580.

8½ inches long, for relief valves or hydrant use.

Sizes, 1 to 1½ inch, inclusive, ... polished brass, $10.00 ; nickel plated, $12.50

Smooth Bore Nozzle.

FIG. 585.

13 inches long, for distance playing.

Sizes, ⅞ to 1½ inch, inclusive, ... polished brass, $9.00 ; nickel plated, $9.75

Oyston Spray Nozzle.

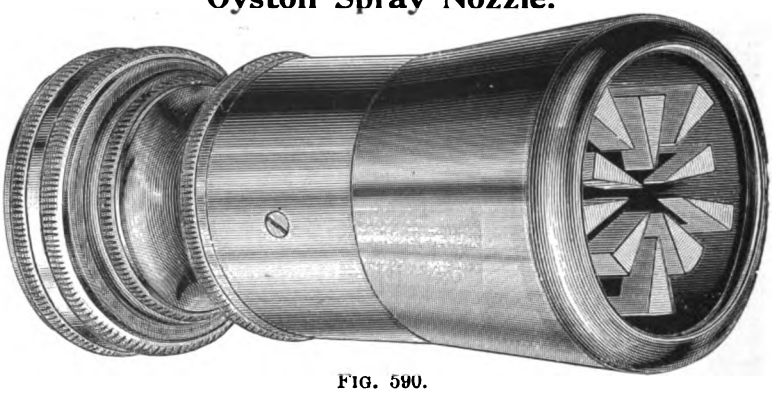

FIG. 590.

This nozzle enables the pipemen to approach and enter a burning building, and with it the excessive use of water and unnecessary damage to goods may be avoided. It consists substantially of a common nozzle having a number of small levers pivoted around it near the outer end. These levers extend about two inches beyond the end of the nozzle, and are enclosed in a neat cup or guard, completely protecting them from injury. The ends of these levers are connected with a collar in such a manner that, when the collar is revolved one-eighth of a revolution to the right, the wedge-shaped parts of half the levers are projected into the stream, dividing it up into a number of triangular streams. By turning the collar one-eighth of an inch further, the remaining four levers are projected into the stream, dividing it into double the number of streams. These streams, after leaving the nozzle a few feet, become a dense mass of flying spray.

1 inch, brass, $11.00 ; nickel plated, $12.00 | 1¼ inch, brass, $13.00 ; nickel plated, $14.00
1⅛ inch, brass, 12.00 ; nickel plated, 13.00 | 1½ inch, brass, 15.00 ; nickel plated, 16.00

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Patent Spray Nozzle, with Gum Protecting Ring.

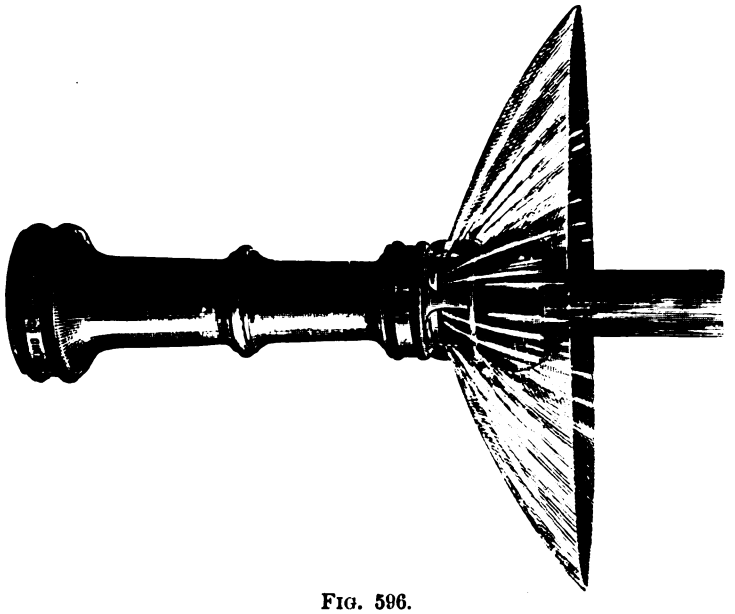

FIG. 596.

The above cut shows solid stream and spray combined. The spray nozzle has proved itself to be a very effective weapon for fighting smoky fires, as by means of the spray the smoke is driven from in front of the fireman, and he can advance without fear of suffocation, as the spray keeps a cool current of air in front of him, he having at the same time the full efficiency of the solid stream. By simply turning the cage that holds the nipple, the spray is shut off, thereby securing a clean cut, solid stream.

Polished brass, ... ¾ inch, $14.00; 1 inch, $15.00; 1¼ inch, $16.00

Patent Shut-off Nozzle.

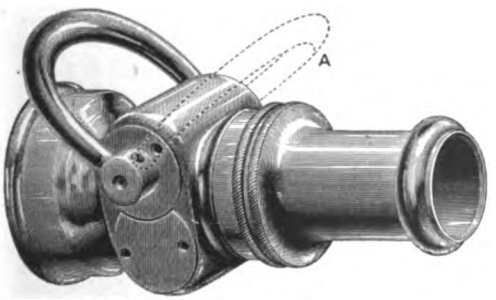

FIG. 600.

This nozzle is very simple and effective in its operation, as the water is shut off completely and instantly by one turn of the handle. It combines lightness, tightness, and automatic packing. Will not freeze when doing duty in the most extreme weather.

Sizes, ¾ inch to 1¼ inch, inclusive, brass, $15.00; nickel plated, $16.00; 1½ inch, $17.00; nickel plated, $18.00. Single spray attachment, extra, $5.00. Double spray attachment, extra, $7.00. 2½ and 3 inch butt, plain shut-off, brass, $25.00; nickel plated, $27.00.

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Hydrant Connection, with Handles.

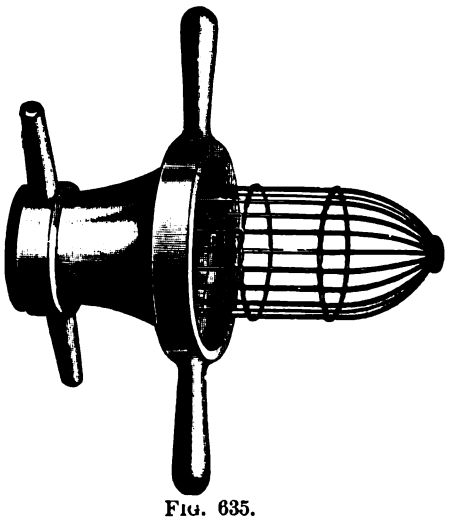

FIG. 635.

3½ inch,	polished brass,	$13.50 ;	nickel plated,	$15.00
4 inch,	polished brass,	15.00 ;	nickel plated,	18.00
4½ inch,	polished brass,	18.00 ;	nickel plated,	22.00

Hydrant Connection.

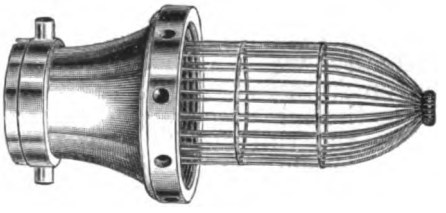

FIG. 640.

3½ inch,	polished brass,	$11.50 ;	nickel plated,	$12.50
4 inch,	polished brass,	12.50 ;	nickel plated,	14.00
4½ inch,	polished brass,	14.00 ;	nickel plated,	16.00

Siamese Connection.

FIG. 645.

For dividing one stream into two.

2 and 2½ inch, brass, painted red, each, ... $10.00

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Siamese Connection.

FIG. 650.

For uniting two streams into one.

2 and 2½ inch, brass, painted red, each, ... $10.00

Siamese Connections.

FIG. 660.

FIG. 661.

This connection serves the same purpose as the ordinary Siamese, with the addition that either branch can be cut off at will.

Fig. 660. 2 and 2½ inch, to unite two streams, brass, painted red, ... $25.00
Fig. 661. 2 and 2½ inch, to divide one stream, brass, painted, ... 25.00

Mending Sleeve.

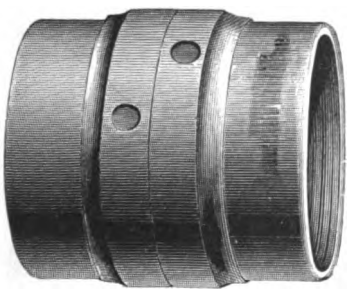

FIG. 662.

For repairing all kinds of hose. It is attached in the same manner as our expanded ring coupling, causing no obstruction of the water-way. It is perfectly smooth on the outside, having no horns to interfere or catch on anything, which makes a more desirable method of repairing than any other article ever made for the purpose. In ordering any of the above, it is necessary for us to know the outside diameter of the hose, as well as the kind they are intended to be used upon.

2½ inch, each, ... $2.75

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Three-way Siamese Connection.

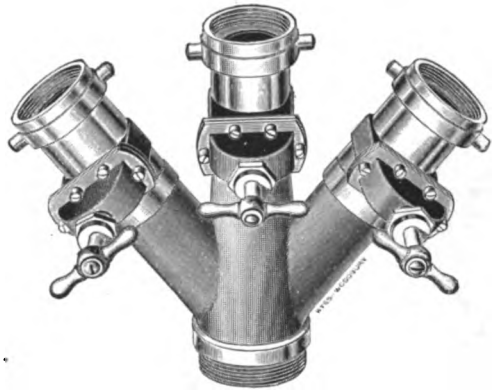

FIG. 665.

This connection is fitted for 2½ inch inlets and a 3 inch discharge. It can be fitted for direct connection with a 3-inch play pipe, or for 3-inch fire hose.

Two-way Siamese,	$25.00
Three-way Siamese,	60.00
Four-way Siamese,	75.00
25 feet 3-inch rubber hose, with couplings and play pipe, extra,	65.00

Single Hydrant Gate.

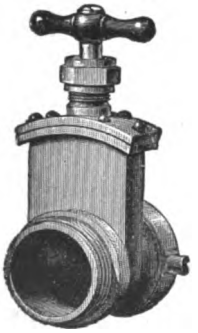

FIG. 670.

Double Hydrant Gate.

FIG. 675.

These gates are for attaching to a hydrant so that one or two lines of hose can be coupled and used without interfering with the others.

Fig. 670. 2 and 2½ inch, painted red,	$10.00
Fig. 675. 2 and 2½ inch, painted red,	25.00

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Silsby F. D. Tubular Lantern.

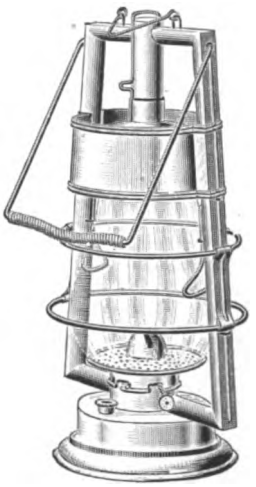

FIG. 721.

14 inches high, for burning kerosene.

We have adopted this lantern for our apparatus. It is furnished with extra large handle to go over fire coat, shield to protect it from water or air, and with loop at top so it can be hung at four different heights.

Brass, $2.50; nickel plated, $3.00.

Fire Department Lanterns.

FIG. 730.

FIG. 735.

Fig. 730. 11 inches high, for burning lard oil or kerosene.
Heavy brass, $5.50; nickel plated, $6.00.

Fig. 735. 10¼ inches high, for burning kerosene.
Heavy brass, $4.50; nickel plated, $5.00.

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Brass Duty Trumpet.

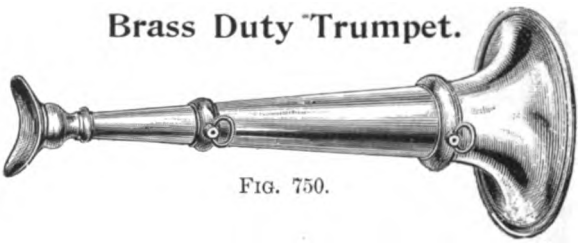

FIG. 750.

12, 14, and 16 inch, ... polished, $4.50 ; nickel plated, $6.00
18 inch, ... polished, 5.00 ; nickel plated, 6.50
20 inch, ... polished, 5.50 ; nickel plated, 7.00

Engraving extra. Leather service strap, $1.00.

Cords and tassels, worsted, for service trumpets, $1.25 ; silk, for parade trumpets, $2.75 ; silk for presentation trumpets, $4.00 to $5.00.

Silver Plated Engraved Trumpets.

FIG. 760.

The design and engraving of each style is different from the others. Photographs sent on application. Cut shows No. 2. Lettering extra. Cases extra according to finish.

No. 1. 20 INCHES HIGH.

Plain, $14.00 ; . . . . . plain and gold lined, $18.00
Chased, 18.00; chased and gold lined, $22.00; fancy gilt, 32.00

No. 2. 14 INCHES HIGH.

Plain, $12.00 ; . . . . . plain and gold lined, $15.00
Chased, 15.00; chased and gold lined, $18.00; fancy gilt, 28.00

No. 3. 23 INCHES HIGH.

Plain, ... $20.00 ; plain and gold lined, . $24.00
Chased X, . . 26.00 ; chased X gilt, ... 30.00
Chased XX, . . 28.00 ; chased XX gilt, . . . 34.00
Fancy gilt X, . . 40.00 ; fancy gilt XX, . . . 44.00

No. 4. 17 INCHES HIGH.

Chased and gold lined, $25.50 ; . . . . fancy gilt, $35.50

No. 5. 22 INCHES HIGH.

Chased gilt, ... $30.00

No. 6. CHASED.

21 inch, gold lined, $33.00 ; gold inlaid and gold lined, $43.00
24 inch, gold lined, 35.00 ; gold inlaid and gold lined, 45.00

No. 7. ORIENTAL CHASED.

18 inch, gold lined, $27.00 ; gold inlaid and gold lined, $37.00
21 inch, gold lined, 30.00 ; gold inlaid and gold lined, 40.00
24 inch, gold lined, 33.00 ; gold inlaid and gold lined, 43.00

No. 8.

19 inch, gold lined, $30.00 ; gold inlaid and gold lined, $40.00
22 inch, gold lined, 35.00 ; gold inlaid and gold lined, 45.00

No. 9. NICKEL SILVER, SILVER SOLDERED.

19 inch, gold lined, $83.00 ; gold inlaid and gold lined, $93.00.

22 inch, gold lined, $90.00 ; gold inlaid and gold lined, $100.00.

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Rubber Cap, with Cape.

FIG. 780.

Per dozen, ... dull finish, $8.00 ; white finish, $12.00

Rubber Coat.

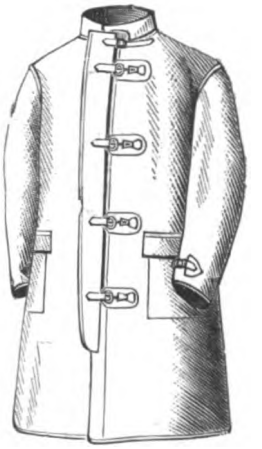

FIG. 785.

The prices below are for the very best firemen's rubber coat in the market. When a cheaper coat is absolutely required, we are prepared to quote prices.

Dull finish, on drill, with snaps, ...	each,	$4.75
Dull finish, double-coated, on jean, with snaps,	each,	5.75
White finish, on drill, with snaps, ...	each,	7.00
White finish, double-coated, on drill, with snaps,	each,	8.75

Rubber Gloves for Pipemen.

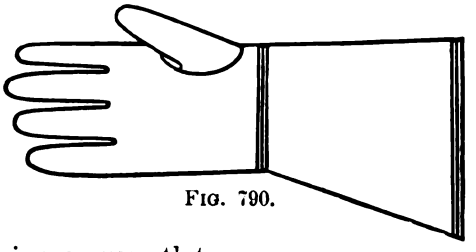

FIG. 790.

No. 1.	Without wool lining or gauntlets, ...	per dozen,	$18.00
No. 2.	With wool lining, without gauntlets, ...	per dozen,	24.00
No. 3.	Without wool lining, with gauntlets, ...	per dozen,	24.00
No. 4.	With wool lining, with gauntlets, ...	per dozen,	30.00

Rubber Boots.

FIG. 795.

Dull finish, wool lined, ... short, $4.50 per pair ; hip, $6.00 per pair.

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Oiled Hats for Pipemen.

FIG. 795.

The brim of this hat is shaped in such a manner that the water flows from the back of the hat in whatever position the head may be inclined. It enables the pipeman to look above with ease, at the same time affording perfect protection for the pipeman's eyes and neck.

Per dozen, ... $10.00

Fire Buckets.

FIG. 800.

No. 1. Rubber, best quality, per dozen, $24.00 ; painted and lettered, per dozen, $30.00
No. 2. Leather, best quality, per dozen, 30.00 ; painted and lettered, per dozen, 36.00
No. 3. Heavy canvas, water-proof, ... per dozen, 16.00

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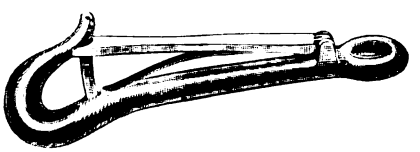
Silsby Patent Snap Hooks.

FIG. 840.

These snap hooks are the safest, quickest to operate, and most reliable on the market. They are made with great care and precision, and each one is inspected by us before being sent out.

No. 1. FOR REINS, WITHOUT SWIVEL.

4¼-inch, japanned,	per set (4), $1.50
4¼-inch, nickel plated,	per set (4), 3.00

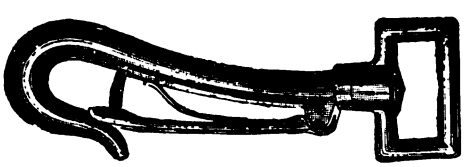


No. 2. FOR TRACE AND POLE CHAINS, WITHOUT SWIVEL.

7-inch, japanned,	per set (4), $2.00
7-inch, nickel plated,	per set (4), 3.75

No. 3. FOR TRACE AND POLE STRAPS, WITHOUT SWIVEL.

7-inch, japanned,	per set (4), $2.00
7-inch, nickel plated,	per set (4), 3.75



No. 4. FOR TRACE AND POLE STRAPS, WITH SWIVEL.

7-inch, japanned,	per set (4), $3.00
7-inch, nickel plated,	per set (4), 4.75

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Engine-House Door Spring.

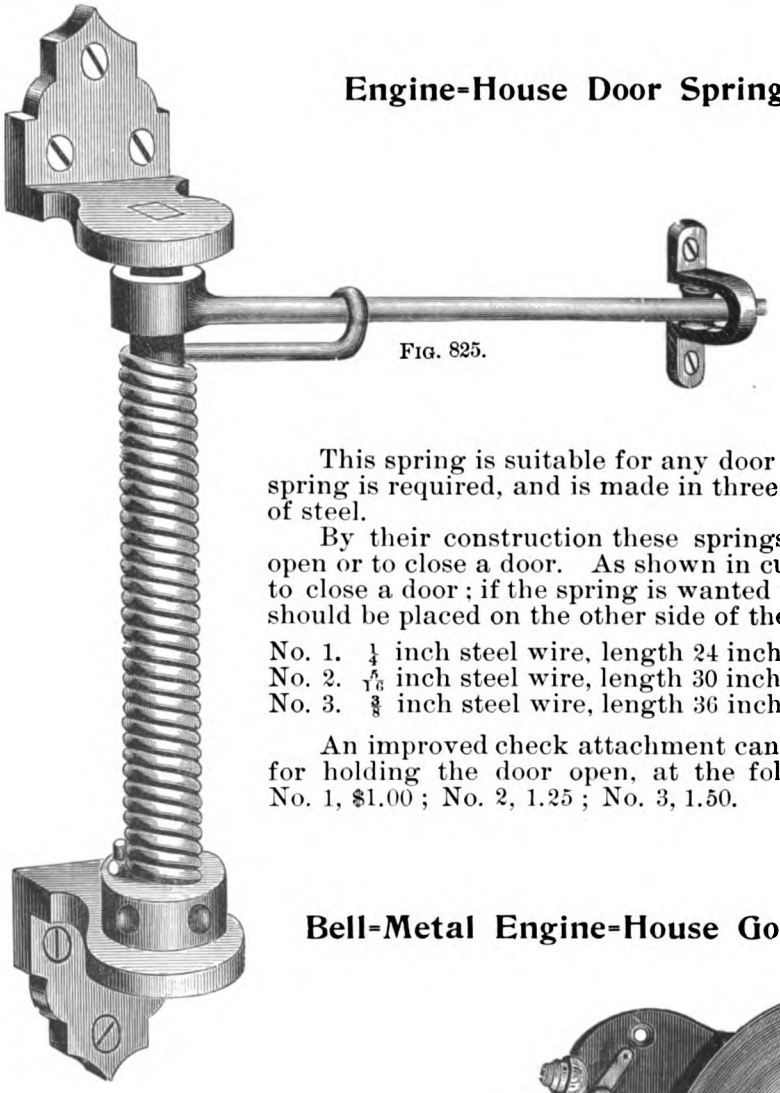

FIG. 825.

This spring is suitable for any door where a strong, durable spring is required, and is made in three sizes of the best quality of steel.

By their construction these springs are adapted to swing open or to close a door. As shown in cut the spring is intended to close a door; if the spring is wanted to open a door, the arm should be placed on the other side of the pulley.

No. 1. $\frac{1}{4}$ inch steel wire, length 24 inches, ... $4.50
No. 2. $\frac{5}{16}$ inch steel wire, length 30 inches, ... 5.75
No. 3. $\frac{3}{8}$ inch steel wire, length 36 inches, ... 8.00

An improved check attachment can be applied to the spring for holding the door open, at the following additional cost: No. 1, $1.00; No. 2, 1.25; No. 3, 1.50.

Bell-Metal Engine-House Gong.

No. 1.	3-inch, finished,	$0.75
No. 2.	4-inch, finished,	1.00
No. 3.	5-inch, finished,	1.50
No. 4.	6-inch, finished,	2.00
No. 5.	7-inch, finished,	3.00
No. 6.	8-inch, finished,	4.00
No. 7.	10-inch, finished,	7.00
No. 8.	12-inch, finished,	12.50
No. 9.	14-inch, finished,	18.50
No. 10.	16-inch, finished,	22.00
No. 11.	18-inch, finished,	25.00

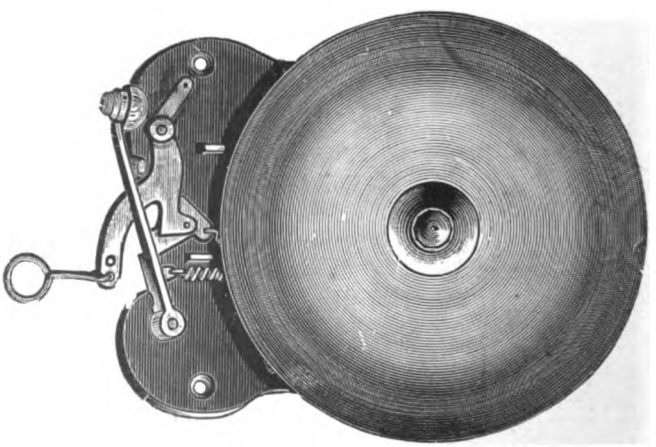

FIG. 830.

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Bell-Metal Gong.

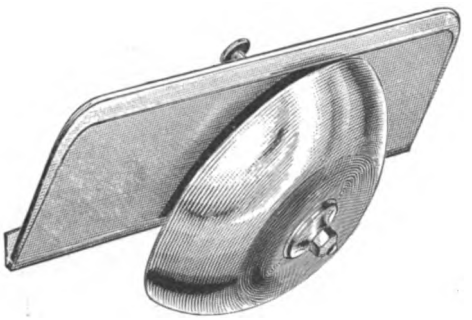

FIG. 845.

This cut shows gong fitted with foot striker. We adapt them also to be struck by a cord, or automatic to be struck by pin in wheel; prices on application.

No. 1.	8-inch bell, with striker, rough, $9.00;	finished, $10.00;	nickel plated, $12.00
No. 2.	10-inch bell, with striker, rough, 10.00;	finished, 11.00;	nickel plated, 13.00
No. 3.	12-inch bell, with striker, rough, 12.00;	finished, 14.00;	nickel plated, 16.00
No. 4.	14-inch bell, with striker, rough, 14.00;	finished, 16.00;	nickel plated, 18.00
No. 5.	16-inch bell, with striker, rough, 16.00;	finished, 18.00;	nickel plated, 20.00
No. 6.	18-inch bell, with striker, rough, 20.00;	finished, 24.00;	nickel plated, 26.00
No. 7.	20-inch bell, with striker, rough, 24.00;	finished, 28.00;	nickel plated, 30.00

Rotary Gong.

FIG. 997.

Patented July 14, 1891; April 26, 1892; other patents pending.

With this gong from 10 to 15 strokes are given by each foot pressure.

No. 1.	11-inch, bronze or nickel plated, ...	$18.00
No. 2.	13-inch, bronze or nickel plated, ...	20.00

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Hose Jackets or Repairers.

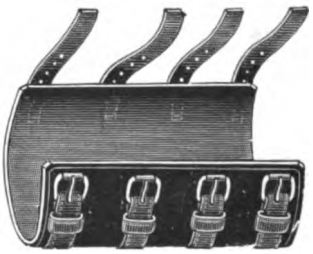

FIG. 890.

Leather, ... per dozen, $18.00

Neely's Patent Hose Leak Stop.

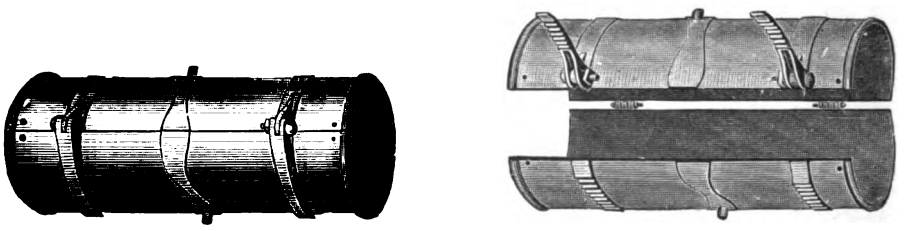

FIG. 895.

This simple contrivance fully meets a need long felt, for a means of stopping *leaks or bursts* in hose. It is lined with rubber, and so constructed by means of racks formed on, and corresponding to the curvature on the surface, that it will securely bind the hose so that the water cannot escape. It can be applied instantaneously, and removed with equal celerity. Wherever the leak stop has been in use, it has been highly approved of, and regarded as the best thing of the kind ever invented.

Price, 2 and 2½-inch, ... per dozen, $36.00

Hand Hook and Pole.

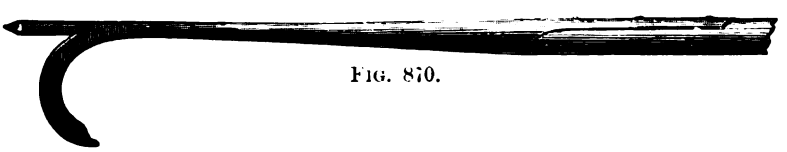

FIG. 870.

Price, with 6-foot pole, ... each, $4.00
Price, with 10, 12, or 14-foot pole, ... each, 5.00

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Hose and Ladder Handle.

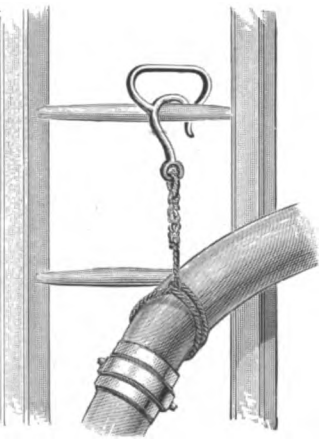

FIG. 905.

This is a cheap device which answers the same purpose as the strap shown below.

Price per dozen, $6.00.

FIG. 910.

Flexible Hose Handle.

For handling linen, cotton, or rubber hose when filled with water.

Price per dozen, $4.00.

Hose and Ladder Strap.

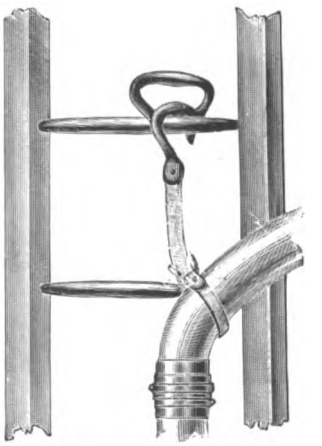

FIG. 915.

Nothing more materially lessens the labor of the fireman than the use of a strap, not only in carrying the hose from one point to another, but in carrying it up a ladder; the hoseman can rest at intervals by placing the hook over any of the rounds of the ladder. One very important thing is the freedom of action it gives the pipeman in directing the stream to much better advantage, as he is relieved of the weight of the hose, no matter at what point on the ladder he may be engaged. They are quickly adjusted, and a glance at the above figure will show how easily it can be done. All the fittings are made of galvanized iron.

Price per dozen, $8.00.

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Double Eyed Spanner.

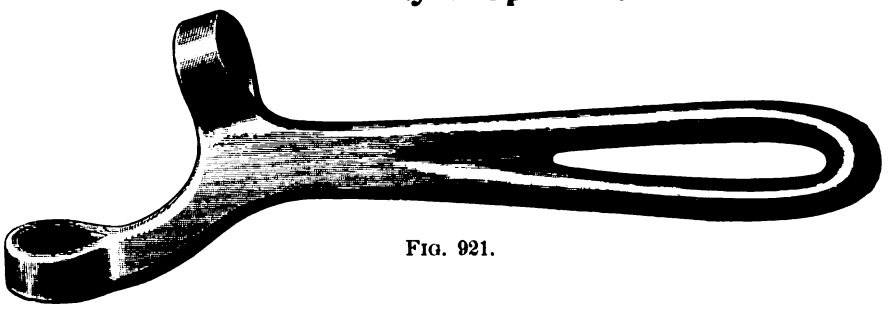

FIG. 921.

2½-inch, japanned, ... per dozen, $6.00

Improved Swivel Spanner.

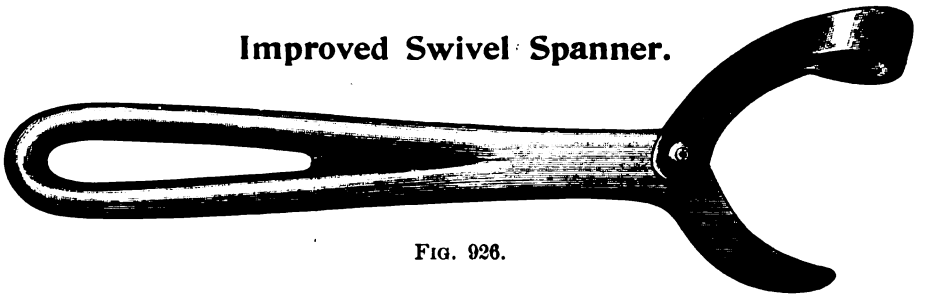

FIG. 926.

Can be used on any size from 2½ to 4 inches, japanned, ... per dozen, $9.00

Pocket Hose Spanner.

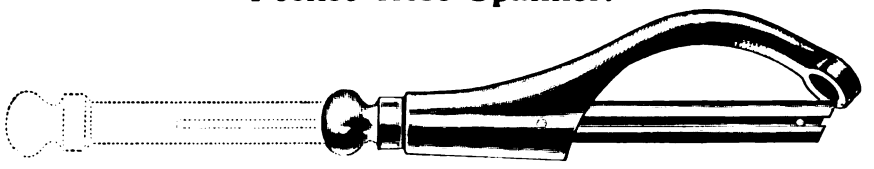

FIG. 931.

2½-inch, polished, and nickel plated, ... per dozen, $15.00

Malleable Iron Hose Spanner.

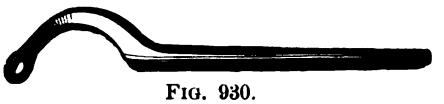

FIG. 930.

2 and 2½-inch, painted, ... per dozen, $4.00
2 and 2½-inch, japanned, ... per dozen, 5.50
2 and 2½-inch, polished and nickel plated, ... per dozen, 9.00

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Taber's Patent Hose Spanner.

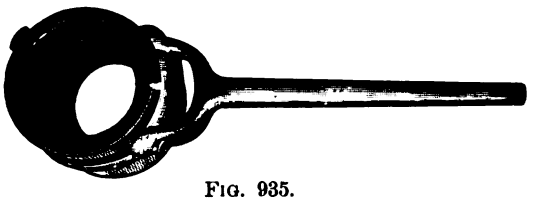

FIG. 935.

1½-inch, malleable iron, galvanized, ... per dozen, $3.50
2 and 2½-inch, malleable iron, galvanized, ... per dozen, 6.00

Hose Spanner and Hydrant Wrench.

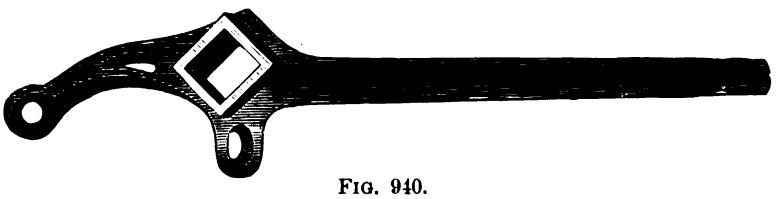

FIG. 940.

2½-inch, malleable iron, painted, per dozen, $6.00; nickel plated, per dozen, $12.00

In ordering give size and shape of hydrant nut.

Bell-Metal Hose Cart Bell, with Spring.

No. 1. 4½-inch, each, rough, $4.50; finished, $5.50; nickel plated, $6.00
No. 2. 5-inch, each, rough, 5.50; finished, 6.50; nickel plated, 7.00
No. 3. 6-inch, each, rough, 6.50; finished, 7.50; nickel plated, 8.00
No. 4. 7-inch, each, rough, 8.00; finished, 9.25; nickel plated, 10.00

FIG. 950.

Engineer's Hand Torch.

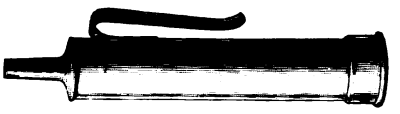

FIG. 970.

Copper, . . . $3.00; polished, . . . $4.00; nickel plated, . . . $4.50

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Double Swing Torch.

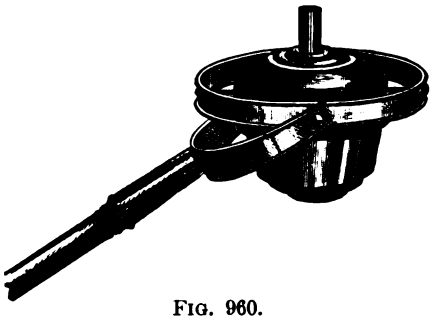


FIG. 960.

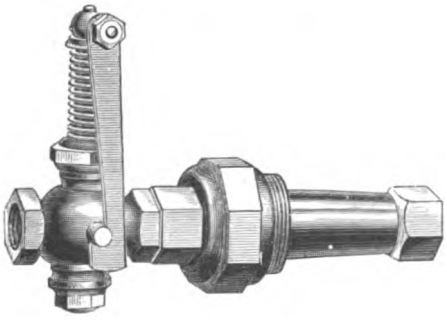
Quarts, polished brass, ... $4.00; nickel plated, ... $4.50
Pints, polished brass, ... 3.75; nickel plated, ... 4.25

Hose Cart Torch.

FIG. 965.

Polished brass, with cap and chain, ... $6.00; nickel plated, . . . $7.00

Automatic Heater Valves and Slip Joints.



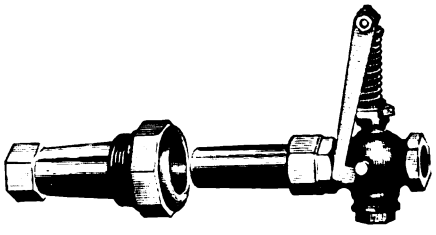


FIG. 996.

¾ and 1-inch, per pair, brass, $15.00; finished, $17.50; nickel plated, $19.00

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Patent Coupling Expander.

FIG. 505.

2 and 2½-inch, each,	$12.00
3, 3½, 4, 4½, and 5-inch, each,	20.00

Fire Axe.

FIG. 850.

No. 1.	34 inches long, Champion fire axes, per dozen,	$20.00
No. 2.	34 inches long, Blood's fire axes, per dozen,	24.00
No. 3.	34 inches long, Hunt's fire axes, per dozen,	30.00

Fire Hatchet.

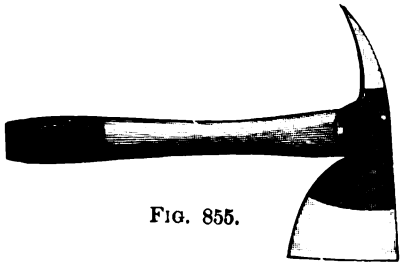

FIG. 855.

13 inches long, per dozen,	$15.00
Leather cases, with strap and buckle, per dozen,	12.00

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Fire Alarm Bells.

FIG. 997.

Steel amalgam, with hangings and frame.

Number.	Diameter.	Weight of Bell only.	Weight complete.	Size of Frame.	Price.
3	18½ inches	65 pounds	172 pounds	27 × 41½ inches	$16.00
4	21 inches	80 pounds	186 pounds	30 × 41½ inches	20.00
5	24 inches	134 pounds	240 pounds	32½ × 41½ inches	25.00
6	28 inches	247 pounds	396½ pounds	36 × 48 inches	40.00
7	30 inches	325 pounds	487 pounds	36 × 48 inches	50.00
8	33 inches	414 pounds	689½ pounds	38 × 48 inches	75.00

Prices of genuine bell-metal fire alarm bells furnished on application.

Smoke Respirator.

Designed to enable a fireman to enter or pass through a building filled with smoke. In respiring the air is inhaled through a wet sponge, and in expiring passes out through a valve at the side.

Price per dozen, . . $24.00.

FIG. 998.

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